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ABSTRACT

A central theme in the history of American education in the 20th century is the expansion of formal schooling for more children. This literature review surveys the research on the educational uses of time, with a focus on the quantity and quality of time that teachers and students spent in school and, to a lesser extent, students' out-of-school activities. The review was undertaken as the first stage of a study that identified and evaluated a collection of reforms designed to enhance learning by altering the amount of and/or the quality of time devoted to learning. Chapters summarize the research on the quantity of time in school, the quality of time in school, and the uses of nonschool time and its impact on academic achievement and social development among young children and adults. Each chapter concludes with a summary and references. (LMI)

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A RESEARCH REVIEW: THE EDUCATIONAL USES OF TIME

VOLUME IV

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INTRODUCTION: THE EDUCATIONAL USES OF TIME
A RESEARCH REVIEW

This literature review surveys the research on the educational uses of time. Because we cover such an amorphous subject, we have tried to define our terms carefully and set clear parameters. We do so with the full knowledge that our categories and sections divide a whole concept into artificial and overlapping parts. Nonetheless, we have chosen to examine the uses of time under two broad headings: in-school time and out-of-school time.

In-school time has gained the most attention of researchers. In general, that research can be categorized as research on the quantity of time in school and research on the quality of time in school. Although we recognize that quantity and quality issues are closely related, we have followed the lead of the existing research and organized the section on in-school time into quantity and quality subsections. The research on the uses of out-of-school time is generally more integrated, mixing issues of quantity and quality. Therefore, we organize the out-of-school section around the variety of educative experiences students engage in when not in school.

The issues of the quality and quantity of time spent in learning are closely intertwined with many recent reform proposals. Some proposals are explicit about the quantity of time and range from calls to alter or extend the school year and school day to programs to combine on-the-job experiences with reduced classroom hours. Nearly all current reform proposals are concerned with improving the quality of learning time. One common theme is allotting blocks of sustained work during the school day, with the goal of increasing the intellectual coherence of school. Other reform agendas call for developmentally appropriate curriculum and innovative age and achievement groupings. Different ideas about time use run as an almost subliminal issue through most recent approaches to educational reform.

Because of the potential scope of the subject, we have had to set some limits. We are primarily interested in the uses of time as it relates to the school-age population. Although the literature review touches upon quantity issues related to the expansion of preschool and kindergarten education, we purposely avoid much of that large body of literature. Similarly, increasing numbers of adults are spending more and more of their time in a variety of educational institutions or continuing their education through their jobs, cultural institutions, and the media; we address those issues in a very limited way. Finally, we realize that our focus on reform initiatives may overlook currently unfashionable, but important ideas. We have tried to address this problem by identifying gaps in the research and placing the issues in historical context.

The terms we use when discussing the uses of time can be confusing, particularly when examining in-school time. Borrowing from Berliner (1990, pp. 4-5), we use the term "instructional time" as the overarching concept that refers to all in-school time. According to Berliner, instructional time encompasses other more specific terms:

> *Allocated time* is defined as time specified for instruction by the state, the district, the school, or the teacher.
>
> *Engaged time* is defined as the time that students appear to be paying attention to materials or presentations with instructional goals.
>
> *Time-on-task* is defined as the time a student is engaged in particular learning tasks.
>
> *Academic learning time* is defined as the time a student is successfully engaged in activities related to valued educational outcomes.

Our interest in the quantity and quality of instructional time leads us to a focus on allocated time (quantity) and academic learning time (quality--whether in school or out). However, many current reform initiatives include schemes for improving the quality of time without differentiating between engaged time, time-on-task, and academic learning time. In addition, terms like "active learning" or "developmentally appropriate" are frequently used in reference to the improvement of the quality of instructional time. Although our review employs terms consistent with the literature, we have tried to be precise about the meaning of the terms we use.

Each section of the literature review is divided into subsections that reflect some current reform initiative or program related to the uses of time. An introduction identifies the broader context of the debate and sets the parameters for the section. We begin with a discussion of the quantity of time in school. This section places the quantity of schooling in historical perspective, explores the literature on the extended school year and school day, examines the comparative debate over the Japanese and American education systems, and briefly discusses the literature on extended school careers.

REFERENCE

Berliner, D. C. (1990). What's all the fuss about instructional time? In M. Ben-Peretz & R. Bromme (Eds.), The nature of time in schools: Theoretical concepts, practitioner perceptions. New York: Teachers College Press.

CHAPTER 1: THE QUANTITY OF TIME IN SCHOOL

"... [O]nce we know that some youngsters receive as little as 18 minutes of instruction per hour, ...what does the researcher who made the startling announcement do for an encore?"

– Philip W. Jackson

Introduction

A central theme in the history of American education in the twentieth century is more and more schooling for more and more children. All measures of schooling emphasize this trend: in 1900, the average student attended 99 days of school, while by 1979 average attendance was 161 days; the school year went from 144 days in 1900 to approximately 180 days in 1991; and although in 1920, 13 percent of whites and 45 percent of blacks had less than five years of schooling, by 1987 those figures had dropped to less than 1 percent for each group (National Center for Education Statistics, 1991; Cremin, 1988, p. 544).

The expansion of formal schooling has steadily increased in a variety of ways. The popularization of higher education after World War II extended a majority of Americans' schooling beyond high school. Following the lead of the Germans in the nineteenth century, Americans have steadily added kindergarten programs to their public school systems and gradually increased their hours of operation. Changes in the structure of the workforce and the structure of the family have also helped increase the number of children enrolled in prekindergarten programs. When placed in this context, current calls to increase the school year, the school day, or the school career continue the persistent trend toward more education for more Americans.

Given this tradition, there is a long history of debate over the length of both the school day and the school year and over the research done on the quantity of time. Even the earliest American educational researchers like Joseph Mayer Rice engaged in the study of instructional time. Contemporary interest in research on instructional time was probably initiated by the work of John B. Carroll. Carroll's 1963 article, "A Model of School Learning," tries to identify the types of basic variables that affect student achievement in school subjects. Carroll expresses three of his five variables completely in terms of time and asserts that aptitude is a matter of individual differences in the amount of time people needed to master a task (Carroll, 1985).

Carroll's work appears to have been quite influential. Benjamin Bloom's interest in Carroll's model of school learning helped spur the development of "mastery learning." Following Carroll's lead, Bloom argues that mastery of learning tasks might be attained by the manipulation of the variables of time, opportunity, and quality of instruction (Bloom, 1985). By the mid-1970s, the model of school learning was applied to the evaluation of total school programs. Partially in response to the Coleman report (1966) and Jencks' *Inequality* (1972), Wiley and Harnischfeger argue that the quantity of school makes a difference in student achievement while finding enormous differences in the amount of education offered across the country (Wiley & Harnischfeger, 1974).

Research on the impact of instructional time on student achievement grew substantially in the early 1980s. Many studies find that allocated instructional time is an important factor in student achievement (Alexander & Pallas, 1983; Brophy & Good, 1986; Crawford et al., 1985; Crawford, 1983; Karweit, 1976; Kiesling, 1984; Schmidt, 1983; Sebring, 1987; Walberg, 1984; Walberg & Frederick, 1983; Walberg & Shanahan, 1983). However, a study by Levin and Mun (1987) uses the perspective of economic theory to predict a rather small increase in educational achievement relative to substantial increases in instructional time. In addition, a number of studies find evidence that different amounts of allocated time had little or no impact on achievement among some age groups and in some subject areas (Cooley & Leinhardt, 1978; Link & Mulligan, 1986; Pittman, Cox, & Burchfiel, 1986; Sanford & Evertson, 1982; Stallings, Needles, & Stayrook, 1979). Taken collectively, the research seems to indicate that allocated time is a necessary, if insufficient, determinant of learning.

Research on the quantity of instructional time has not been without its critics. Some argue that the research has done little except uncover truisms (Phillips, 1985). Others point with alarm at the potential of the research to resurrect the "cult of efficiency" and its accompanying attempts at "scientific management" and "time and motion" studies (Jackson, 1985). Still others argue the research on instructional time has been narrowly focused on the acquisition of basic skills, ignoring important and difficult-to-measure areas of education such as building character, imparting values, and understanding emotions (Fenstermacher, 1985).

Our review of the literature on the quantity of instructional time has alerted us to several neglected areas of inquiry. Research on time and teachers is strikingly absent. Studies on teachers' working conditions indicate that teachers, particularly in urban schools, "labor under conditions that would not be tolerated in other professional settings" (Corcoran, Walker, & White, 1988, p. xiii). However, little is known about the effect on working conditions of extending the school day or the school year. Other studies indicate that most teachers already work 50 hours or more weekly and that reducing the workload will require rebuilding the school infrastructure and adding additional personnel to respond to the multiple-role demands in schools. (Pechman, 1986). However, no studies have been conducted to examine the effect of an extended school day a year on professional workloads.

The literature on the quantity of instructional time has also limited its view by defining instructional time as something that occurs only in schools. Given what we know about the importance of community and family resources and educational outcomes, a broader view of instructional time seems important. Finally, the research on the quantity of instructional time seems to have ignored group and individual differences among students. In too much of the research, "time" takes on a disembodied character, and there is a failure to explore the specific effects of different amounts of instructional time (in various subject areas) on women, minorities, and students from different socioeconomic groups.

Rarely has the issue of the quantity of instructional time been examined in its full social and political context. Such an approach seems particularly useful because proposals to extend the school day and/or the school year have been such a common component of recent school reform initiatives. Yet, Americans seem to have reserved judgment on the merits of more school time for their children. Their ambivalence over the issue is understandable. On the face of it, the logic of more school is compelling--if students get more instructional time, they will achieve at higher levels. In addition, changes in traditional family schedules and parental work lives make the long summer vacation increasingly obsolete. On the other hand, Americans seem hesitant about investing the billions of dollars it would take to find out if more is better.

The ambivalence of Americans over the issue is appropriate given the contradictory and incomplete research on the uses of time in school. Proponents point to the long Japanese school year and Japanese students' high test scores. Opponents point to the prohibitive costs, insisting that quality issues should come first. But definitive educational research will not resolve the issue because the quantity of time debate applies educational remedies to issues both personal and political. As with many educational issues, there is no agreement on how to define the problem, much less solve it. Expert proponents and opponents of more school time see the issue in rational terms--a question of logic or cost effectiveness. Many educators see politicians infringing on their profession. At the same time, some skeptical teachers argue morally that the problem with the uses of time is in its misuse in the home, not in the school. Many parents view the issue in similar moral terms--teachers and other parents need to do a better job of managing their children's time. Many Americans share these moral concerns but focus their criticism on lazy and disrespectful students. Whomever the culprit(s), the disparate definitions of the problem associated with the school time issue suggest both a lack of consensus and the need to examine the uses of time in a broad context.

Extending the School Day/Year

One way to affect the quantity of time children spend in school is by extending the number of hours in a school day or the number of days in a school year. This section examines the issue of increased instructional time for all students. It summarizes the main arguments used by supporters and opponents of extending instructional time in the United States. It also discusses recent reform efforts at the state level designed to increase the minimum number of hours in the school day, or days in the school year. The section concludes with a discussion of the costs involved in extending instructional time for all students and a summary of recent trends in public opinion on the issue of extending the school day or year.

The Recent Debate on Extending Instructional Time

Over the past decade, a significant amount of literature has been written on the subject of extending instructional time in schools. What sparked much of this discussion was the 1983 release of *A Nation at Risk* by the National Commission on Excellence in Education. Citing the poor academic performance of children in the United States and the discrepancy between the amount of time that American children spend in school compared with their peers in other industrialized nations, *A Nation at Risk* called on state legislatures and school districts to adopt a seven-hour day and a 200- to 220-day school year.

Since the release of *A Nation at Risk*, a number of policymakers and educators have supported an increased school day and school year (Barrett, 1990; Doyle & Finn, 1985; Education Commission of the States [ECS], 1983). Most proponents of extending school time in the United States rely on international comparisons in presenting their argument (National Education Association [NEA], 1987). Although *A Nation at Risk* compared the quantity of time spent in American schools with instructional time in England, stating that "in England and other industrialized countries, it is not unusual for academic high school students to spend eight hours a day at school, 220 days per year," Japan's school year has recently become the focus of recommendations for extended instructional time in the United States. The following table, compiled by Michael J. Barrett (1990), a Massachusetts state legislator, highlights the discrepancy in the average school year between the United States and other nations:

Number of Days in a Standard School Year

Japan	243
West Germany	226-240
South Korea	220
Israel	216
Luxembourg	216
Soviet Union	211
Netherlands	200
Scotland	200
Thailand	200
Hong Kong	195
England/Wales	192
Hungary	192
Swaziland	191
Finland	190
New Zealand	190
Nigeria	190
British Colonies	185
France	185
Ontario	185
Ireland	184
New Brunswick	182
Quebec	180
Spain	180
Sweden	180
United States	**180**
French Belgium	175
Flemish Belgium	160

Many proponents of an extended school year claim that this discrepancy in annual instructional time explains the differences in achievement between American students and their peers in other nations. Although there is considerable evidence that children in other industrialized countries outperform children in the United States (Barrett, 1990; Stevenson, Stigler, Lee, & Lucker, 1985), the validity of such comparisons is often debated. For example, with the notable exception of Japan, countries that keep students in school until their late teens tend to score lower on international assessments of mathematics and science (Medrich & Griffith, 1992). Further, some critics argue the sampling problems associated with the international educational comparisons are so severe that few real conclusions can be drawn and few lessons learned that will help improve American education (Rotberg, 1990).

Even more widely criticized is the assumption that increased learning time will significantly improve performance. Researchers generally conclude that simple increases in the school day or year, without corresponding reform in the quality of instruction, would have a modest effect, if any, on student achievement (Moore & Funkhouser, 1990). In reviewing positions taken by well-known researchers on the issue of extending the school day and year, the National Education Association (1987) reported that the majority recommend as an immediate policy option making more efficient use of existing time rather than considering an increase in school time. Most agree that extending the school day or year, without first improving the quality of instruction and the percentage of school time spent "on task," would produce disappointing results. Levin even suggests that, given the current level of student motivation and incentives to learn at the secondary level, an increased school day may have negative effects:

> . . . by increasing the "costs" to the student by having to spend more time in what is often an oppressive and uninspiring environment, dropout rates may increase and some students may be turned off to further learning. Additionally, some students may reduce their effort to compensate for the larger time commitment that they must make (Levin, 1984).

Although both supporters and opponents of increasing the school day and year in the United States present compelling arguments, the debate lacks solid evaluative data from states or districts that have actually made such reforms. There are no studies that directly measure the impact of extending the school year within a controlled experiment design (Hossler et al., 1988); similarly, no studies exist on the direct effect of "adding time" to the school day (Hossler et al., 1988). Finally, because no state or district has reformed its school day and year to the degree called for in *A Nation at Risk*, the effects of a massive change remain mere speculation.

State Actions to Reform Educational Uses of Time

Despite the controversy surrounding the issue of extending the school year or day in the United States, many states have considered such measures in recent years. In 1985, just two years after the release of *A Nation at Risk*, Nancy Karweit writes that "about two-thirds of the states are considering legislative actions or committee task force reports to change the amount or scheduling of school time." Since 1983, proposals to lengthen the school day or year have been considered in 37 states (Barrett, 1990). In Virginia, for example, the state's governor supported a plan to extend the school year from 180 to 200 days (Baker, 1991). However, the state legislature rejected the bill in response to strenuous lobbying by the state's tourism industry.

Despite the flurry of activity, very few proposals to increase the school day or year have actually been approved by state legislatures:

- In the 1990 legislative session alone, bills involving the length of the school year were rejected in 10 states (ECS, 1990)
- Since 1983, only nine states--Arkansas, Colorado, California, Florida, Nebraska, New Hampshire, North Carolina, South Carolina, and Tennessee--have adopted new legislation or regulations increasing the number of school days each year (Barrett, 1990; NEA, 1987)
- During the same period, five states--California, Maryland, Michigan, South Carolina, and Wisconsin--have adopted new legislation or regulations increasing the number of hours in the school day (NEA, 1987)

- In 1983, the North Carolina legislature lengthened the school year to 200 days and the school year to seven hours in two districts (Levin, 1984). Within three years, both districts had abandoned the experiment and returned to a traditional schedule; in one of the districts, community dissatisfaction was so great that the superintendent and the local board were unseated (ECS, 1990).

Notably, even in those states that have passed legislation extending the school day or year, the reforms have fallen far short of the recommendations made in *A Nation at Risk*. In fact, none of the states passing legislation since 1983 increased the school day beyond six and one-half hours or the school year beyond 180 days. Instead, recent successful legislation has addressed unusually low standards in certain states and merely increased their instructional time closer to the national norm (Barrett, 1990).

According to the Education Commission of the States (1989), the only state that requires a school year longer than 180 days is Ohio, which established its current 182-day school year before the recommendations of *A Nation at Risk*. Thirty-four states, the District of Columbia, and Puerto Rico require a 180-day school year. Two states require 176 days, and 12 require 175 (some of the slight differences result from states building "snow days" into the total). Only in Missouri (174) and Minnesota (170) is the school year less than 175 days. Similarly, as of November 1985, only two states--Tennessee and Texas--required a seven-hour day (NEA, 1987). In contrast, more than half of the states have school days between five and six hours long (Hossler et al., 1988).

Barrett (1990) points out that the above standards are merely established minimums for instructional time and that "thousands of towns, cities, counties, and independent school districts in the United States are legally free, sometimes subject to state review, to extend the school year." However, few have done so. According to the National Association for Year-Round Education, only eight schools in the nation require their students to attend at least 210 days (Panton & Rosenthal, 1991).

The Cost of Extending Instructional Time

A major factor preventing states and districts from increasing school time is the cost. Richard Rossmiller, chairman of the Department of Educational Administration at the University of Wisconsin, claims an extension of the school day or year is "politically impossible" because "the public won't stand for [the cost]" (Mazzarella, 1984). Indeed, the cost of increasing the school day or year in the United States would be staggering.

- According to a study by the ECS, extending the school day to eight hours would cost the nation more than $20 billion annually, as would extending the school year from 180 to 200 days (Mazzarella, 1984; Ellis, 1984)

- The National Association for Year-Round Education has calculated that the daily expenditure on education in the United States is $1.1 billion. Using this figure, if each state's daily per pupil expenditure remained constant, an added 20 days of instruction would cost the nation $22 billion, consistent with the ECS study cited above.

- In a study of 28 school districts, the American Association of School Administrators (1983) determined that the cost of a seven-hour day, 200-day year would increase the districts' budgets by 14.3 percent

Given the enormous expense of extending the school day and year, some researchers have questioned the cost efficiency of such reform. The Institute for Research on Educational Finance and Governance compared the costs and effects of four interventions for improving reading and mathematics scores: (1) peer tutoring, (2) reduction in class size, (3) increase in the length of the school day, and (4) computer-assisted instruction (Levin, 1984). The study finds that, on a cost-effectiveness basis, increased instructional time ranked last with respect to improving student performance in mathematics and second-to-last in improving reading performance.

Public Opinion

Another factor inhibiting state legislatures from extending the school day and year may be the public's traditional opposition to such increases. Even in 1959, when events such as the launching of Sputnik sparked new American concern about the nation's educational system, a Gallup poll revealed that 67 percent of the public opposed increasing the number of days per year spent in school for high school students, while only 26 percent were in favor (Barrett, 1990).

Similarly, in the early 1980s, a majority of Americans opposed extending the school day and year. In a 1982 Gallup poll, after being informed that "in some nations students attend school as many as 240 days a year as compared to 180 days in the United States," 53 percent opposed an increase of 30 days per year, while 37 percent were in favor (NEA, 1987). In 1984, following the release of *A Nation at Risk* and the subsequent debate about the discrepancy between school time in the United States and other industrialized countries, public support for an extended school year increased slightly to 44 percent; however, 50 percent of Americans remained opposed. Support for extending the school day also increased slightly during this time but remained a minority opinion. In

1982, 37 percent of Gallup's sample favored extending the school day by one hour, and 55 percent opposed it; in 1984, 42 percent supported this measure, and 52 percent were in opposition.

In 1989, Gallup asked the following question, which does not specify how or when time would be added:

> In some nations students spend about 25 percent more time in school than do students in the United States. Would you favor or oppose increasing the amount of time that students in this community spend in school?

After being asked this question, 48 percent of the survey's respondents favored an increase in school time, while 44 percent opposed it (Barrett, 1990). This result indicates that American opinion may be moving toward majority support for increased time in school. However, it is important to point out that, because of the inconsistency in the phrasing of Gallup's questions, a strict comparison between this finding and results from earlier polls cannot be made.

Year-round Schools

The vast majority of elementary and secondary schools in the United States continue to operate on a September-June calendar, a schedule that may have been created to support the agricultural economy of the early 1800s (Ballinger, Kirschenbaum, & Poimbeuf, 1987). Supporters of year-round education question the use of this traditional academic calendar, claiming that there is no need for an agricultural-based school calendar in the latter part of the twentieth century and that the three-month summer vacation is an unnecessary interruption in instruction. Although the concept of year-round schooling has existed for some time, the number of year-round schools has increased dramatically in recent years. A decade ago there were 349 year-round schools in the United States with a combined attendance of 278,000 students. Today there are more than 1,600 year-round schools in 23 states, and it is estimated that more than one million students attend these schools (Mydans, 1991). Year-round schooling is particularly popular in the western part of the country. Approximately 23 percent of the students in California and 13 percent of those in Utah and Nevada attend year-round schools (Panton & Rosenthal, 1991).

With few exceptions, most year-round schools restructure the existing 180-day calendar without requiring an increase in attendance; because of this, year-round education is primarily a quality of time issue. However, year-round schooling also belongs in a discussion of quantity of time in school because: (1) the year-round calendar represents a dramatic departure from the traditional

September-June calendar and thus may facilitate future lengthening of the school year; (2) through the use of "intersession" instruction, many year-round schools provide the option for increased time in school for at least some students; and (3) research shows that student attendance is often better in year-round schools than in traditional schools, thereby increasing the time some students receive instruction.

Year-round Schooling and the Quantity of Time in School

With the notable exception of the expense of increasing the school year, America's love for long, lazy summer vacations may stand as the greatest obstacle to a significant increase in the number of days in the school year. Because it breaks the psychological barrier of the long summer vacation, the year-round academic calendar is considered by some to be a necessary first step in lengthening the school year well beyond 180 days. Supporters of year-round schooling claim that through incremental shortening of break periods, the schedule allows for a smooth transition to longer school years (Mydans, 1991). However, at this point very few of the country's 1,600 year-round schools require that their students attend more days of school than the minimum mandated by state law (notable recent exceptions include the Lockett and Moton elementary schools in New Orleans, which for a 2-year experimental period provided 220 days of regular instruction, and New Stanley Elementary School in Kansas City, Kansas, which operates a 205-day school year) (Ballinger, 1991).

Use of Intersessions

Despite this, many year-round schools do reform the quantity of time that students are in school through their uses of breaks or "intersessions" to provide remediation and enrichment for many of their students. Through intersession programs, students in many year-round schools can receive additional instruction during the year, increasing their academic year to 210 days and beyond. Most year-round schools offer some form of intersession classes; however, the nature and extent of these services vary from school to school. For example, many year-round schools concentrate their intersession efforts on remediation for disadvantaged students, while others also provide enrichment programs (Panton & Rosenthal, 1991).

Supporters of year-round schooling argue that, unlike traditional summer schools, intersession programs provide the opportunity for intensive assistance to low achieving students during the year, helping them avoid falling far behind their peers. In his annual report on the status of year-round education, Charles Ballinger, Executive Director of the National Association for Year-Round

Education, argues that "one of the dumbest things we educators do is to put marginal students through nine months of failure and frustration and then ask them to return to summer school for quick remediation. The intersession, however, is a logical time to pursue remediation" (Ballinger, 1991).

Many year-round schools offer intersession services to some or all of their students. The following examples illustrate a few intersession programs at year-round schools:

- Alice Birney Elementary School in San Diego, California, offers two-week intersession classes for its lowest achieving students three times each year, extending the maximum number of days of instruction to 210. Intersession classes generally consist of math review and literature-based, cross-curricular activities.
- The South Bay Union School District in California has instituted a successful intersession program called CHOICE (Children Having Options, Innovations, Challenges, and Enrichment), which allows students to receive an additional 45 days of instruction each year. District evaluation following the program's pilot year revealed that students attending two or more 15-day CHOICE sessions showed greater improvement on standardized achievement tests than their peers who did not attend the sessions.
- Tangelo Park Elementary School in Orlando, Florida, offers three two-week intersession programs to all of its students, allowing them up to 210 days of instruction per year. In 1990-91, up to 85 percent of the school's students attended intersession classes for either remediation or enrichment (Panton & Rosenthal, 1991).
- Located in a lower-middle class suburb of Los Angeles, Palm Avenue School operates a year-round "Orchard Plan," which allows up to 223 days of annual instruction. The school offers all students full-day remediation and enrichment services during intersession. Overall, approximately 70 percent of its students have returned for some form of intersession activity. (Gandara & Fish, 1991)

Year-round Schooling and Student Attendance

When discussing the number of hours and days available for instruction in elementary and secondary schools, it is important to remember the crucial role that a student's attendance plays in the quantity of instruction that he or she receives. Quite simply, an increase in the school day or school year can always be offset by a similar increase in student absenteeism. Notably, there is a significant disparity between attendance rates of students with high socioeconomic status (SES) and those with low socioeconomic status (National Center for Education Statistics [NCES], Table 144, 1991); similarly, attendance tends to be a greater problem in urban schools than in suburban schools.

Because a multitrack, year-round calendar can increase a school's capacity to serve large numbers of students by always having some on vacation, year-round education has been particularly popular in overcrowded urban districts such as Los Angeles, which adopted a year-round schedule for all of its schools in 1991. Although districts may turn to year-round schooling because of overcrowding, the new calendar may yield some unexpected and beneficial outcomes. For example, numerous evaluations and district reports indicate that absenteeism among students tends to be lower in year-round schools than in traditional-calendar schools (Ballinger et al., 1987; Gandara & Fish, 1991; Quinlan, George, & Emmett, 1987; White, 1987, 1988). One such study, conducted in the Jefferson County Colorado School District in the late 1970s, reveals that attendance in the district's elementary, junior high, and senior high schools improved after the year-round program began (White, 1987). Year-round schooling also may play a beneficial role in reducing dropout cases. In their review of year-round education, Zykowski et al. (1991) cite several studies (Guthrie, 1985; Quinlan et al., 1987; White, 1988) that report lower dropout rates in year-round schools, compared with traditional-calendar schools.

Theories explaining the connection between improved student attendance and year-round schooling vary. One popular theory is that the traditional "September-phenomenon"--more frequent vacations, student eagerness, and readiness to return to school--occurs three or more times each year, reducing burnout (Ballinger et al., 1987; Brekke, 1991). Similarly, others hypothesize that marginal students find it easier to "hang in there" longer with a vacation always in sight (Gitlin, 1988). Another theory is that year-round schedules provide greater variety in seasonal breaks, allowing families to take vacations throughout the year without pulling their children from classes. Likewise, flexibility in scheduling at Oxnard, California's move to a year-round calendar, reduced absenteeism among the district's heavy population of migrant children (Brekke, 1991).

Extended School Career

The quantity of time that children spend in school can also be viewed from the perspective of a student's school career. In this section, we briefly discuss a few ways in which the quantity of time students spend in school can be increased in the beginning, middle, or end of a traditional 12- or 13-year precollege career. For example, an increasing number of students are participating in full-day kindergarten and prekindergarten programs, extending the quantity of time they spend in school at the beginning of their careers. Occurrences of grade retention, particularly in the first few years of school, have also been on the rise recently; holding back a student is another way to increase the number of years he or she spends in school--albeit a highly controversial one. Finally, an increasing number of students, particularly those with limited proficiency in English, are using fifth and sixth years to complete their high school educations, thereby extending the duration of their secondary school career.

Preprimary Instruction

The past 25 years have witnessed dramatic growth in the amount of preprimary instruction available to children in the United States, thereby increasing the quantity of time that many children spend in school during their school careers. According to the U.S. Department of Education's "Current Population Reports," in 1964, 4.3 percent of three-year-olds, 14.9 percent of four-year-olds, and 58.1 percent of five-year-olds were enrolled in preprimary programs; in 1984, these percentages had grown to 27.8, 44.8, and 83.9 respectively (Trostle & Merrill, 1986).

In the past decade alone, state involvement in kindergarten instruction has exploded. In 1983, no state mandated that school systems provide kindergarten programs (Demmon-Berger, 1986). In contrast, a recent survey by the ECS (1989) revealed that 32 states now require that kindergarten programs be provided. Furthermore, in six of these states, kindergarten attendance is mandatory for all children, although in some cases children may pass an approved readiness test in lieu of kindergarten.

In addition to this growth in state-mandated kindergarten, there has been an increase in the number of full-day kindergarten programs. In New York State, for example, the percentage of students in full-day programs grew from 9.5 percent in 1972-1973 to 57.9 percent in 1985-1986, marking the first time in recent state history that a majority of kindergarten students were in full-day programs (Puleo, 1988). In his review of research on full-day, everyday kindergarten programs, Puleo cites the following reasons for this growth:

- The need for early acquisition of basic skills and the value of teachers having additional time to attend to individual pupil needs (Gilstrap, 1970; Gorton & Robinson, 1968, 1969; Ross, 1976)
- The hope that such programs will reduce grade retention and stem the tide of special education and remedial placements (Herman, 1984)
- Increases in the number of working women, and the subsequent need for full-day programs (Salzer, 1982)

According to Puleo, much of the research on full- and extended-day kindergarten programs "suffers from serious problems in internal and external validity" and the fact that "reports tend to be brief, and claims are frequently made without presentation of data." However, Puleo does reach the following conclusions about full- and extended-day programs in his review of the research:

- Short-term gains in basic skills tend to be greater in full- and extended-day programs than in half-day programs
- Sufficient class-size reduction in half-day programs (to 16 or fewer students) may negate the benefits of full-day programs
- Full-day instruction appears to be most effective for students from lower socioeconomic backgrounds
- Long-term effects of full-day kindergarten compared with half-day kindergarten are inconclusive

The enrollment rate for three- and four-year-olds in preprimary programs has also grown dramatically in recent years, from 11 percent to 39 percent since 1985 (Day & Thomas, 1988). However, although 85 percent of enrolled five-year-olds attend public schools, prekindergarten remains a largely private function; 68 percent of enrolled three-year-olds and 56 percent of enrolled four-year-olds attend private schools, according to a U.S. Department of Education study (Day & Thomas, 1988). Notably, state legislative interest in prekindergarten programs grew dramatically in the 1980s, although no state currently offers preschool programs for all its four-year-olds. Among the reasons for this increase in state interest were (1) increased employment among mothers of young children, (2) an increase in the number of children in poverty, and (3) well-publicized research documenting the positive long-term effects and cost-effectiveness of preschool programs (Berreuta-Clement, Schweinhart, Barnett, Epstein & Weikart, 1984; Lazar & Darlington, 1982; Morado, 1986a; Trostle & Merrill, 1986). Almost half the states now support some preschool programs, most of which are targeted for children who are economically disadvantaged, limited in their use of English, or otherwise at risk (Day & Thomas, 1988). Most programs are relatively recent developments; of the existing state-funded prekindergarten programs, those in all but four states were introduced in 1980 or later (Morado, 1986). State programs vary greatly in their scope, with Texas's $46 million program serving 48,000 prekindergarteners often cited as the most ambitious (Gnezda & Sonnier, 1988).

Student Retention

For many students, the quantity of time they spend in school during their career is extended because they are held back and forced to repeat a grade. Before the 1980s, the rate of nonpromotion had declined in previous decades, according to Holmes and Matthews (1984); however, recently this trend has reversed. According to Karweit (1991), "The current educational reform movement has seen an increased focus on standards and corresponding increased rates of grade repetition." In fact, says Karweit, in many urban districts the cumulative effect of retention is such that one in two students will repeat a grade by the third grade.

In the long run, grade retention may decrease the quantity of time a child spends in school if he or she (more often he, according to Karweit) experiences a subsequent lack of success in school and eventually drops out. Indeed, grade retention versus social promotion has been hotly debated for many years, with many current researchers focusing on the negative consequences of grade retention (Karweit, 1991). In their meta-analysis on nonpromotion, Holmes and Matthews (1984) concluded the following:

> Those who continue to retain pupils at grade level do so despite cumulative research evidence showing that the potential for negative effects consistently outweighs positive outcomes.

Indeed, the benefits of extending the quantity of school time in this way seem questionable. In her review of the research on grade retention, Karweit (1991) concluded that:

- Studies comparing students when they are in school for equal time favor promoted students over nonpromoted students
- Studies comparing students in the same grade (unequal time) either favor retained students or show no difference
- Studies presenting longitudinal comparisons show that any positive effect of retention fades out over a two- to three-year period

High School "Hang-Ins"

An increasing number of students are extending their quantity of time in school by "hanging in" high school for an additional year or two. According to the U.S. Bureau of the Census, as of October 1989, 24 percent of all 18-year-olds, 5 percent of 19-year-olds, and 1 percent of 20- and 21-year-olds were still attempting to finish secondary school (Flax, 1991). In fact, in New York City, high school "hang-ins" appear to be more numerous than dropouts. A recent study by the city's Educational Priorities Panel revealed that 25 percent of the city's class of 1986 were still enrolled the following year, and many remained in school beyond their fifth year; in contrast, 22 percent of the class dropped out before their scheduled graduation (Flax, 1991). This large pool of nontraditional students has prompted the growth of a number of alternative programs that allow older students with greater work and family responsibilities to continue their coursework through evening and summer school, PM school, shared instruction, and independent study (New York City Board of Education, 1990).

Comparisons with Japanese Education

Recently, proponents of an extended school year and/or an extended school day have almost invariably cited the 240-day Japanese school year and the strong performance of Japanese students on achievement tests as proof of their case. Indeed, it has become nearly impossible to discuss the uses of time without addressing the Japanese education system. In general, the argument is that:

> While the typical American student attends school 180 days a year, his Japanese counterpart--and competitor--goes to school 240 days a year. When the Japanese student graduates from high school, he or she has completed the equivalent of at least two years of a good American college (Kearns & Doyle, 1989).

Others claim that the disparity between the Japanese and American school day and year results in the fact that "over the twelve years of elementary and secondary education, the Japanese student actually receives four more years of schooling" (Rohlen, 1983).

Given the fact that Japanese students' scores on international achievement tests are among the highest in the world, many reformers assume that the quantity of schooling in Japan is the primary causal factor. But recent comparative research on Japanese and American education systems and cultures suggests that other factors may be more important. One study by Stevenson et al. (1985) establishes that both Japanese and Chinese children scored higher on mathematics tests than American children; however, similarity was found among the level, variability, and structure of each group's cognitive abilities. Thus, the authors conclude that the higher achievement of Chinese and Japanese children is not attributed to higher intellectual abilities but, rather, to their experiences at home and school.

Researchers who have looked closely at Japanese home and school experiences have uncovered some significant differences between Japanese and American childrearing and teaching practices. Hess and Azuma (1991) argue that national differences in educational achievement can best be understood through analysis of cultural differences in student dispositions toward formal schooling. Their comparative study of Japanese and American mothers and children identifies the significantly higher congruence of the Japanese culture of the home and the culture of the school.

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Holloway's (1988) review of research on ability and effort in Japan and the United States uncovers important differences in the meaning of the concepts that have implications for achievement motivation. The research indicates that effort is identified as the primary determinant of achievement in Japan, while ability is more heavily emphasized in the United States. In addition, Japanese homes and families foster task involvement by promoting interpersonal cooperation rather than competition and by downplaying noticeable evaluation. Although a more complete accounting of the values and resources invested in Japanese children has not been made, the impact of home and family resources has been estimated. Heyneman and Loxley (1983) find that in Japan 70 percent of the variation in primary school science achievement was due to the home and community environment (as opposed to school quality).

Significant differences between Japanese and American teaching also appear to have some implications for student achievement. Stigler and Stevenson's study of Japanese teachers finds that the practice of teaching "is more uniformly perfected than it is in the United States because their systems of education are structured to encourage teaching excellence" (Stigler & Stevenson, 1991). Others point out that Japanese teachers spend only 60 percent of their day in the classroom and the rest of their time preparing lessons and planning with colleagues (Sato & McLaughlin, 1992). Sato and McLaughlin also note that the Japanese view academic knowledge as just one part of the development of the whole person. As a result teachers' responsibilities include the aesthetic, physical, mental, moral, and social development of students. They argue that the longer school year "supports the broader Japanese conception of goals for education and includes more time devoted to nonacademic studies and activities . . . rather than simply more time in conventional academic instruction" (Sato & McLaughlin, 1992).

Although there is no dispute that, overall, Japanese students spend more instructional time in core subjects like mathematics, the research on Japanese education tends to support the finding that, as in the United States, allocated time is a necessary, if insufficient, determinant of learning. In other words, the quantity of school time may have much less to do with cross-cultural differences in academic achievement than the quality and the convergence of the full range of family, community, and school resources.

Summary

In this chapter, we have highlighted the central tendencies in research and in less data-based discussions concerning the annual schedule of schooling and the total amount of time that American students spend in school. In general, the American education system continues to cling to the traditional agrarian educational calendar, despite arguments and some research evidence that shorter vacation periods spaced throughout the year decrease the learning attrition caused by the long summer break. The number of districts operating year-round schools has increased over the past decade, primarily to accommodate overcrowding. However, few year-round plans actually add time spent in school except through use of intersessions for remediation as enrichment. Several states have passed legislation adding days to the school year or hours to the school day--but only to bring their schools in line with the national average.

We have, perhaps, not done full justice to innovative approaches that reduce or streamline time in school for some adolescent populations. Some of the literature on successful dropout prevention or recovery programs indicates that flexible schedules combining academic learning and work have more holding power for disaffected teenagers. In short, for some students, less may be more. This is a theory that could bear some future research scrutiny.

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CHAPTER 2: THE QUALITY OF TIME IN SCHOOL

"The great skill of a teacher is to get and keep the attention of his scholar; whilst he has that, he is sure to advance as fast as the learner's abilities will carry him; and without that, all his bustle and bother will be to little or no purpose."

--John Locke

Introduction

Whether policy changes occur in the quantity of time students spend in school, there are many ways to change or reform what Sarason (1971) calls the "regularities" within the traditional school day, school year, or school career. The conceptual challenge for the Uses of Time study is to identify and design means for evaluating time-related structural reforms that might significantly alter the traditional and often unquestioned relationships between people, materials, and processes within schools. These relationships include:

- The time teachers and students spend together--daily, weekly, annually, or across multiple school years
- The curriculum content covered by teachers and students within a given timeframe
- The time teachers spend in various roles, e.g., as lecturer, as facilitator, as mentor
- The time that students engage in different kinds of activities, e.g., passive vs. active learning
- The groups in which students spend their school time, e.g., same age vs. multiple age groups, same ability vs. multiple ability groups
- Technology that may augment or enhance relationships between teachers, students, and content

Most of us (and our parents and our children) have experienced school in the same, highly recognizable ways. We moved through a graded structure, beginning with kindergarten or first grade and ending with twelfth grade. (This is sometimes referred to as a "lockstep" system, where at a given age, every child progressing "normally" can be expected to be at a particular grade level.) Every year, we were assigned to a classroom where all the students were about the same age (students who were older were known to have "stayed back"). If we were not assigned to a class where everybody was more or less at the same level of academic progress, we knew that subgroups would be formed within the larger class--and, after first grade, we knew exactly who would be in our group and the status of our group relative to others. In high school, we were fully aware of the various tracks and the expectations of and for the students in them.

In our classrooms, teachers mainly talked and students mainly listened, talking only when called on. Teachers taught through textbooks that organized and paced what we learned. As individuals, we were responsible for learning from texts and teachers; rarely did we learn from or with each other. One thing we learned exceptionally well: we were always in direct competition with our peers for the good scores on tests and the grades on our report cards. If we helped someone out, we did both them and ourselves a disservice. At examination time, what counted was the abstract knowledge in our heads--unassisted by tools, advance organizers, or understanding of real world, practical applications.

This is a sketch of life in classrooms as we have known it, and as the majority of students in America continue to know it. Many of the classroom-based reform efforts of the past decade have, in theory, chipped away at some of the regularities of schooling described above, but there are no clear indications that change has taken place on a large scale. Rather, there appear to be pockets of activity--sometimes at the district or school level, often at the classroom level within schools.

The various research literatures that we have examined about the quality of time in school often do not directly address the time-related relationships between people, materials, and processes within schools. Our task has been to tease out evidence and arguments that have bearing on how to improve the quality of time that students spend in school. We focus on reforms that both alter the traditional configurations of time in school and hold promise for qualitatively improving students' and teachers' school experiences. The areas that we cover include:

- A brief review of research on quality issues in year-round schools
- An examination of research on grouping and scheduling practices
- The potential for enhancing the quality of in-school time through the use of technology, paying particular attention to recent research on use of computers in classrooms

An area that we touch on only tangentially but which has implications for the overall Uses of Time Study is the depth, breadth, and coverage of the curriculum as it applies to the efficient use of time in school.

Year-round Schooling and the Quality of Time in School

We begin by revisiting year-round schooling. Although the name may indicate otherwise, year-round schools generally require just 180 days of instruction each year, similar to traditional-calendar schools. Year-round schools, however, spread these 180 days throughout a 12-month period to provide more frequent, but shorter, vacations. This can be done in a number of ways. A "45-15" plan, for example, divides the academic year into four nine-week quarters, each followed by a three-week vacation or "intersession." A "60-20" plan, on the other hand, divides the calendar into three terms, each consisting of 12 weeks of instruction and a four-week break. Although there are a wide variety of year-round school schedules, all are distinguished by their elimination of the traditional three-month summer vacation.

Because most year-round schools restructure the existing 180-day school year without requiring that their students spend additional time in school, year-round schooling is primarily a reform in the quality of time spent in school. Supporters of year-round education claim this restructuring of the academic calendar is educationally beneficial because it can result in greater continuity of instruction, improved retention of learning during the summer, a reduction in time needed for review at the beginning of a new term, and more time available for covering new material (Ballinger et al., 1987; Ballinger, 1991; Brekke, 1991).

In her review of studies of summer learning and summer schools, Barbara Heyns (1987) concludes that "there is general agreement that children learn at a slower rate during the summer than during the school year." The presence of a summer "drop-off" in learning is well documented among disadvantaged children, according to Heyns and others. Indeed, a number of studies have confirmed the existence of a summer-learning gap between disadvantaged students and their peers (e.g., Heyns, 1978; Kilbanoff & Haggart, 1981). A common argument presented by supporters of year-round schooling is that students in traditional-calendar schools "take two steps forward from September to June, and one step back during the three-month summer vacation," requiring lengthy review each fall (Brekke, 1991). When aggregated over 12 years, they point out, fall review sessions account for a significant amount of time that could otherwise be used to introduce new material (Ballinger et al., 1987). Research on the effect of year-round schooling on student achievement is inconclusive. In their review of year-round education research, Zykowski et al. (1991) state that comparisons between student achievement in year-round schools and in traditional-calendar schools produce mixed results. They note that no studies show definitively that student achievement in year-round programs differs from that of students in traditional school programs. According to Zykowski et al., several studies find "no significant difference in achievement between students on year-round calendars and students attending traditional calendar programs." However, at least some districtwide evaluations have highlighted gains made by students at year-round schools. For example:

- In a 1991 study, the San Diego Unified School District conducted an evaluation of its schools, comparing performance on standardized tests between year-round and traditional schools in the district at three grade levels, in three subjects, and at three interval points. According to the district's superintendent, in 17 out of 27 test score comparisons, year-round schools outperformed traditional schools (Alcorn, 1991).
- After adopting a year-round format, both third- and sixth-grade students in the Oxnard (California) School District dramatically improved their performance on California Assessment Program (CAP) testing in reading, mathematics, and written expression. For example, Oxnard's average CAP grade six reading score improved from 200 to 237 (+37) between 1982 to 1990; during the same period, California's students as a whole improved just seven points, from 254 to 261. Notably, the discrepancy between improvements in the Oxnard School District and in the state as a whole was even greater among Chapter 1 students, indicating that year-round schooling may be a particularly effective reform for serving disadvantaged populations (Brekke, 1991).

There is thus some indication that eliminating the three-month summer vacation may have a particularly strong effect on the achievement of disadvantaged students, especially those from homes and neighborhoods where English is not the primary language spoken (Brekke, 1991). However, this finding would need to be replicated many times before the assertion could be made with confidence.

In conclusion, supporters of year-round education contend that eliminating the three-month summer vacation reduces learning loss, particularly among disadvantaged students, and allows more time for the introduction of new material. However, the literature lacks significant research comparing the level of learning loss among students at year-round schools with those at traditional-calendar schools. Nor are there any rigorous studies showing that achievement among students in year-round schools differs significantly from student achievement in traditional-calendar schools.

Homogeneous Grouping for Instruction

Teachers, curriculum and assessment, and instructional strategies are all important factors affecting the quality of time that students spend in school. However, the ways in which students relate to adults, cover academic content, and take advantage of opportunities to learn are strongly controlled by two overarching organizational characteristics of schools--grouping and scheduling. A number of reform initiatives seek to improve the quality of students' overall educational experiences by altering these variables.

A sizable body of literature addresses the effects of instructional grouping practices on student learning. How instructional groups are formed, and their size and stability help shape the quality of the time students spend in school, including the social environment in which students learn, the curriculum, the pace of instruction, and a host of other learning conditions (NGA, 1988, p. 10). Traditionally, instructional groups in elementary schools consist of about 25 students to a classroom with three to five ability groups per class. At the high school level, tracking is a prevalent means of grouping students. Inherent in both designs are two major bases for forming instructional groups--age and ability/achievement. Further, grouping for instruction, whether based primarily on age or ability/achievement, has traditionally been based on the belief that homogenizing groups for instruction is desirable. But a growing body of evidence suggests that effective alternatives to this pattern exist, many of them designed to accommodate a heterogenous classroom, such as mixed-age and mixed-ability groupings within and across classrooms (Cuban, 1989, p. 801).

In this section and the next, we discuss the two major methods of forming instructional groups--homogeneous and heterogeneous groupings--as they apply to both age and ability/achievement. We first review the literature on the effects of the traditional, homogeneous approach on teaching and learning.

Homogeneous Groupings

Definitions. Homogeneous grouping of same-age students for instruction is the basis of the graded school and currently the dominant form of school organization in this country. At the elementary level, students generally start school at the same age, with the goal of progressing, as a group, to higher grade levels. At the secondary level, there is more mixing of ages, as, for example, a ninth and tenth grader of different ages may both take Algebra I, but such situations are not usually deliberately aimed at mixing students of different ages together. Traditionally, instructional groups within the age-graded system are further homogenized by ability/achievement. Ability grouping, as it is commonly called, occurs both within classrooms and among classrooms of students at the same grade level. Most schools in this country follow this practice, and most teachers support it (Slavin, Karweit, & Madden, 1989, p. 241). In theory, ability grouping allows teachers to increase the pace and level of lessons for high achievers and provide more review and remediation for low achievers. In addition, ability grouping supposedly motivates high achievers to work harder while placing success within the reach of low achievers, who are protected from having to compete with their more able classmates (Atkinson & O'Connor, 1963, as cited in Slavin, Karweit, & Madden, 1989, p. 242).

Slavin identifies two types of ability grouping prevalent in U.S. schools, within-class and between-class grouping. Within-class ability grouping refers to assigning students to a homogeneous group within a self-contained, heterogeneous classroom. The most common use of this strategy occurs in the formation of reading groups, in which teachers assign students to one of a small number of groups based on their reading level (Slavin, Karweit, & Madden, 1989, p. 242). The groups may use different materials or progress through the same materials at different rates.

Slavin and his colleagues also identify seven types of between-class ability groups, in which students are grouped across self-contained classrooms within a school, including two plans that group students of the same ability across grade levels. Slavin describes the types of between-class ability groups as:

1. Ability-grouped class assignment--students are assigned on the basis of ability or achievement to one self-contained class (usually at the elementary level) or to one class that moves together from teacher to teacher, as in block scheduling in junior high schools

2. Curriculum tracking--a special form of ability-grouped class assignment in which students are assigned by ability or achievement to tracks, such as college preparatory, general, or vocational. Students may take all or only some of their courses within these tracks.

3. Regrouping for reading or mathematics (ability grouping for selected subjects)--students are assigned to heterogenous homeroom classes for part or most of the day, but are "regrouped" according to achievement level for one or more subjects

4. Joplin Plan--a special form of regrouping for reading in which students are assigned to heterogenous groups for most of the day but are regrouped for reading across grade levels. For example, a reading class at the fifth grade, first semester reading level might include high-achieving fourth graders, average-achieving fifth graders, and low-achieving sixth graders. Reading group assignments are frequently reviewed and reassignments made as needed.

5. Nongraded plans--in its broadest application, grade-level distinctions are entirely removed, and students are placed in flexible groups, according to their performance level, not their age. Students move from group to group and complete the curriculum at their own pace.

6. Special classes for high achievers--plans in which gifted, talented, or otherwise superior students are assigned to a special class for all or part of their school day, and other students remain in relatively heterogeneous classes

7. Special classes for low achievers--the assignment of students with learning problems to special or remedial classes for all or part of the day

At the secondary level, curriculum tracking is the most common form of ability grouping. Junior and senior high school students are frequently assigned to courses by ability or previous performance in school (Slavin, Karweit, & Madden, 1989, p. 242). Especially in large schools where master schedules are the lifework of an assistant principal, placement in one course (often mathematics) can dictate all of a student's class options.

Tracking often starts with reading groups and assignment to compensatory education programs in elementary school. However, it is in junior high school that the concept of "honors" and "remedial" tracks create real divergence among instructional programs. Tracking received considerable research attention in the 1980s and virtually all recent findings about this practice have been negative (see, for example, Gamoran, 1987; Oakes, 1985; Oakes & Lipton, 1992). Among those findings are:

- Tracking does not promote achievement for average and low-ability children, but rather appears to retard the progress of these groups
- Tracking is not required to promote achievement for high-ability students
- Tracking often leads to poor self-esteem, lowered aspiration, and negative attitudes toward school among slower students
- Tracking tends to promote teaching that wrongly assumes that the academic needs of the tracked students are the same; detracked schools tend to promote more effective and tailored learning activities
- Poor and racial minority students, mainly blacks and Hispanics, are disproportionately placed in tracks for low-ability and noncollege-bound students

Critiques of same-age grouping practices. Increasingly, educators and researchers question same-age and same ability grouping practices. A growing body of research addresses the benefits of grouping children of different ages together (Brookes, 1990). Pratt (1983), for example, observes that segregating children by age is a recent departure from social patterns existing for millions of years. Ellis, Rogoff, and Cromer (1981) offer support for the natural attraction of mixing children of different ages together. They observed the composition of children's groups in an urban setting large enough to allow same-age groups to form spontaneously, and discovered that, for all age groups, strict age segregation was less common than might be expected; target children were with same-age peers in only 6% of the observations (Katz et al., 1990, p. 2).

Some literature argues that same-age classrooms may foster negative conditions for teaching and learning. For example, when same-age students are expected to learn the same things at the same time, those who do not may be labeled "failures" and penalized through grade retention. In contrast, when age groups are mixed, the inclusion of a range of ages translates into a wider range of behaviors deemed "acceptable" (Katz et al., 1990, p. 4, 47). Further, Katz argues that because mixed-age grouping compels educators to organize learning activities and materials so that individuals and groups can undertake different types of work alongside each other, students have some real choice about what work they do, and when and how to do it (Katz et al., 1990, p. 5-7). In such an environment, these authors believe students are more likely to make ego-enhancing choices that lead to positive self-evaluations (Greenberg, 1990, as cited in Katz et al., 1990, p. 7).

Research on Ability/Achievement Grouping

Many educators are worried about the effects of within-class grouping, particularly on lower-achieving students. Much of their concern is based on the perception that different groups of students receive different kinds--a different quality--of instruction (Knapp & Shields, 1990, pp. xii-6). As the Council for Basic Education views the situation:

> Students in the fast group are pushed ahead quickly; students in the slow group move hardly at all. Those in the fast group are exposed early and continuously to higher order concepts--they discuss ideas, write about their thoughts, and read books. For those in the slow group, everything is broken down into "manageable" little bits of no inherent interest. Most teaching is accomplished through dittos (CBE, 1989, p. 3).

Despite recent concerns about and critiques of within-class ability grouping, research on its effects indicates mixed results. Slavin conducted two syntheses of research on ability grouping. The first (1986) focuses on grouping in elementary school mathematics classrooms. (In this country, elementary school mathematics instruction is typically a whole-group activity.) All eight studies reviewed find grouping students by ability within classrooms produced positive student learning outcomes, although the results were not always statistically significant. In the five studies comparing the effects of grouping on high, average, and low achievers, effects were strongest for low achievers.

Slavin's second study (1990) looks at ability grouping at the secondary school level. Here, the research fails to show positive effects. Slavin speculates that the standardized tests used in the studies may not have been sensitive enough to register the grouping effects (Allan, 1991).

Slavin's 1986 review also examine the effects of seven types of between-class ability grouping. He concludes that, overall, research does not support the assignment of students to classrooms on the basis of ability. He also finds no evidence that ability grouping by classroom is either especially beneficial for high-ability students or especially detrimental for lower-ability students. However, among the 14 studies that examine the effects of the Joplin Plan--a strategy that reassigns students by ability during the reading block only--11 show positive effects on reading outcomes. Slavin concludes, therefore, that classroom ability grouping for a limited portion of the school day may be instructionally beneficial.

The Success for All program, a primary grade intervention for disadvantaged students developed by Slavin and his colleagues at Johns Hopkins University, employs small, relatively homogeneous ability groups for reading and mathematics instruction. An early evaluation report on the implementation of this program in the Baltimore City Schools indicates that student achievement in reading has generally improved across grades (McCollum, 1991, p. 90).

Other meta-analyses also support the value of homogeneous ability grouping. For example, Kulik (1991) identifies three types of ability grouping:

- Type I--simple programs in which all students are taught with the same or similar materials and by the same or similar methods
- Type II--programs in which teaching materials and methods are adjusted to meet the special needs of a specific aptitude group (e.g., enriched instruction for the gifted and talented)
- Type III--programs in which adjustment of teaching materials is so extensive that it affects a student's rate of progress through school (for example, programs of accelerated instruction)

Kulik reports that all three types of programs produce some student gains. However, Type III programs have, by far, the strongest impact. He expresses concern that most evaluations focus on Type I programs and that the evidence that they produce only small gains in student learning has been used unjustifiably to conclude that all ability grouping programs do not work and should be eliminated.

An earlier (1982), Kulik and Kulik meta-analysis of the effects of ability grouping on secondary students concludes that ability grouping positively affects student achievement. Slavin and his colleagues criticize this analysis, however, on the grounds that the positive effects rested entirely on nonrandomized studies (Slavin et al., 1986, p. 245).

Allan (1991) also reviews ability grouping research and identifies positive effects. Specifically, she reviews the meta-analysis conducted by Kulik and Kulik (1982, 1984) and the best evidence syntheses of Slavin (1986, 1990). Allan argues that when one delves into the studies comprising these syntheses, the research questions actually being asked are often quite different from those to which the results may be applied. For example, she notes that the Slavin research did not ask whether programs for gifted or special education students were effective. These programs were systematically omitted from Slavin's 1986 research. Yet, Slavin's syntheses clearly address these questions. Allan argues that when grouping research is reviewed with attention to the specific research questions addressed, the studies reviewed by Kulik and Kulik and Slavin support the following conclusions:

- Ability grouping provides positive academic benefits for gifted youth
- Low and average students benefit from regrouping by subject in elementary schools
- The preponderance of evidence does not support the conclusion that children are harmed by grouping
- Self-esteem may be enhanced for lower-ability students and only slightly lowered for average and high ability students

Other researchers and reviewers (e.g., Eash, 1961; Hallihan, 1986; Persnell, 1977; Wilkinson, 1986) concluded otherwise. A review of 217 studies of both tracking and within-class grouping finds that the slight evidence for improving high ability students in grouped situations was greatly offset by the detrimental effects on middle and low-achieving students (Persnell, 1977, as cited in Knapp & Shields, 1990, pp. xii-6).

Wilkinson (1986) argues substantial evidence indicates that lower teacher expectations and lower quality teaching result in a negative learning environment for lower-ability students. For example, elementary students in low groups are (1) corrected--and thus interrupted--more frequently; (2) given more instruction in decoding and phonics than other, more intellectually stimulating strategies; and (3) frequently less attentive than higher-ability peers (Allington, 1980; Eder, 1981, 1982, 1983; Eder & Femlee, 1984; Rist 1970). Lindow, Wilkinson, and Peterson (1985) also indicate that lower ability students had fewer opportunities to demonstrate what they did know to others in their group, and thus fewer opportunities to receive feedback on the adequacy of their knowledge (Wilkinson, 1986).

Research by Clark (1989) suggests that besides a lower quality of instruction, lower-achieving students also receive less literacy stimulation (e.g., learning-to-learn skills, content thinking skills, basic reasoning skills, communication skills, and emotional and psychological skills). He estimates that in a six-hour school day, high achievers are "engaged" in literacy stimulation for about three-and-one-half hours, whereas low achievers are engaged for only one-and-one-half hours (Clark, 1989, as cited in CCSSO, 1989, p. 20).

Several researchers note the damaging psychological effects on students designated in the "low" or "dumb" group (Oakes, 1985; Rosenbaum, 1980; Schaefer & Olexa, 1971, as cited in Slavin et al., 1989, p. 242). Further, research indicates assignment to a low group can become a persistent pattern throughout a student's school career, as suggested by a series of studies involving reading groups at both the elementary and secondary levels (Eder, 1982; Weinstein, 1976; Wilkinson & Calculator, 1982; Wilkinson & Spinelli, 1983, as cited in Wilkinson, 1986). Rosenbaum (1980) finds that groups at the junior and senior high school levels also tended to become fixed and the only mobility between groups was downward (Wilkinson, 1986).

Heterogeneous Grouping for Instruction

In this section, we examine what research says about alternatives to same-age and/or same-ability instructional grouping. The terminology for instructional strategies placing students of different ages in the same classrooms or instructional groups varies in the literature--mixed-age grouping, multi-age grouping, family grouping, multigrading, nongrading. We use the terms interchangeably and as preferred by the individual researchers cited.

Mixed-age and Nongraded Grouping Strategies

Now, as in 1900, the graded school--where six-year-olds are first graders and eight-year-olds are third graders--is the standard organizational structure in American schools. What it means to be a third grader or a ninth grader is largely determined by a textbook-based curriculum that allocates skills to be learned to particular ages and grades. In contrast, nongradedness refers to a structure for school organization that allows formation of instructional groups based on some criteria other than age. Proponents of a nongraded structure reject the expectation that all six-year-olds or all twelve-year-olds are or should be at the same stage of intellectual, social, or emotional development. Although nongradedness is not defined by a single, uniform model, Pavan (1972) suggests that in all nongraded schools:

- Each individual works in varied situations where he or she will have opportunities for maximum progress. There are no procedures for retention or promotion, nor any grade levels.

- A child's placement may be changed at any time, if it is felt to be in his or her best interests in any of the five phases of development: aesthetic, physical, intellectual, emotional, and social (Goodlad & Anderson, 1987, p. xv).

Under the general rubric of a nongraded structure, many things might change. Students might spend a longer time with one teacher. They might regularly interact with multiple age groups. The depth and breadth of the curriculum might be altered. The pacing of instruction could be viewed within an entirely different timeframe.

Although there is currently renewed interest in the nongraded approach to school organization, the concept is by no means new. Indeed, many of the earliest designs of informal and formal schooling did not divide students by age. Divisions were more often made according to gender. Neither seventeenth-century "dame schools," eighteenth-century "district schools," nor rural one-room schools were graded. Ungraded schools have been used by British and New Zealand educators for some time. In these systems, all students enter into a nongraded unit where they stay until they demonstrate the ability to pass on to the next level. There is no "skipping" and no "failure" (Connell, 1987, p. 33; Fetzer & Ponder, 1989, p. 194).

In the United States, the development of graded schools corresponded with a variety of social, economic, and demographic changes and the purposeful assessment of early education "experts." Some authors note the influence of graded schools in Prussia on early common school advocates. (Cremin, 1980). Others point to the influence of textbook publishers and the production of sequential and graded books (Apple, 1986; Goodlad & Anderson, 1987). Still others view graded schools as replicating the structure of social relations existing in the workplace. (Bowles & Ginitis, 1976).

Twentieth-century criticisms of graded schools began during the progressive school movement, resulting in a variety experiments in nongraded schools and cross-age grouping. (Cremin, 1961). Interest in nongraded schools revived sporadically in the late 1950s, the 1960s, and again in the early 1970s. In the past few years, reform initiatives have increasingly incorporated nongraded primary schools (grades K-3) as part of a strategy for school improvement:

- As of 1992, all elementary schools in the state of Kentucky must begin to implement a developmentally appropriate curriculum in an ungraded K-3 unit, with full implementation planned by 1995

- The San Diego public school system Promotion Task Force Report acknowledges that grade level "retention formalizes a pattern of failure many students never overcome." The superintendent's office is exploring a switch to K-3 nongraded units and has already held workshops for principals on the issue (Dr. Till, Asst. Superintendent, San Diego School District).

- House Bill 3565, the "Oregon Educational Act for the 21st Century," passed in August 1991, strongly recommends exploring the use of nongraded units. A report to the legislature by the "21st Century Council" exploring the feasibility of implementing nongraded units statewide was due in 1993 (Shirley Gidley, Oregon State Department of Education, telephone conversation, Oct. 1991).

- Several other states, including California, Florida, Virginia, and West Virginia, are encouraging and/or investigating the use of ungraded primary units (Cathy Christie, Education Commission of the States, telephone conversation, Dec. 1991).

Although a growing number of districts are experimenting with nongraded arrangements, precise statistics on the prevalence of nongraded schools or units within schools are unavailable. Goodlad and Anderson attribute the lack of good data in this area to (1) definitional issues regarding what to count and (2) the fact that few recent research and development projects focus on alternative school organizational structures (Goodlad & Anderson, 1987, p. Xiii).

Many of the newer initiatives focus on a nongraded, multi-age structure for preschool and the early grades. A dominant theme in the nongraded literature is that the graded school is particularly inappropriate for young children. During these years, children need to develop a range of social, emotional, physical, and cognitive abilities (Goodlad & Anderson, 1987, p. xxv). Therefore, it is important, as one consultant advising Kentucky's systemic reform effort notes, that programs for young children "fit the child instead of making the child fit the school" (Kantrowitz & Wingert, 1989; Kentucky Department of Education, 1991). Similarly, in a recent publication, the National Association for the Education of Young Children (NAEYC) heartily advocates mixed-age grouping of young children, noting that the many advantages research suggests it offers students in primary grades are likely to be even greater for younger children (four- to six-year-olds) (Katz et al., 1990, p. x).

Research Evidence on the Effectiveness of Nongraded or Multi-age Grouping Arrangements

Although research on the impacts of nongrading and mixed-age grouping is not uniformly positive, a number of studies generally support experiments in these directions. Probably the best known examination of nongraded schools is Goodlad and Anderson's *The Non-Graded Elementary School*, first published in 1959 and updated in 1987. Based on a review of achievement data from a sample of graded classrooms, they report:

- Children entering the first grade differ in mental age (as measured by intelligence tests) by approximately four full years (p. 6)
- A child's achievement patterns differ markedly from learning area to learning area (p. 28)
- By the time children reach the intermediate elementary grades, their range in intellectual readiness to learn and in most areas of achievement is as great or greater than the number designating the grade level (p. 28)
- By the fourth or fifth year of school, more than half the achievement scores in a class are above and below the grade level attached to the group (p. 28)

Goodlad and Anderson use these findings as a rationale and framework for synthesizing and examining the research on a nongraded structure for schools. Their work is a primary source for our own examination of this literature.

In 1962, Buffie conducted one of the earliest carefully designed studies of nongraded schools. He matched four graded schools from one community with four nongraded schools from another community, comparing impacts for samples of students continuously enrolled in each type of school. All significant differences and all trends in academic achievement and mental health favored the nongraded students (Goodlad & Anderson, 1987, p. 216).

Pavan (1977) examines all available comparative research studies on graded versus nongraded organization for instruction reported between 1968 and 1976 (37 in all) and concludes:

- Comparisons of graded and nongraded schools using standardized achievement tests continue to favor nongradedness
- Enrollment in a nongraded school may improve the student's chances for good mental health and positive attitudes towards school
- Longitudinal studies indicate that the longer students are in a nongraded program, the more likely it is they will have positive school attitudes and better academic achievement
- A nongraded environment is particularly beneficial to the academic achievement and mental health of blacks, boys, underachievers, and students of lower SES

A later review of empirical studies on multi-age groupings for instruction (Pratt, 1983) suggests achievement advantages to mixed-age groupings, although there was no consistent relationship (Katz et al., 1990, p. x). Out of a total of 25 studies addressing academic achievement, 10 favor multi-age grouping and 12 studies are inconclusive. Three studies clearly favor conventional grouping (Katz et al., 1990, p. x).

Other research directed at academic achievement of students in mixed-age groups indicates that their achievement is no different than that of age-graded students. Miller's (1990) synthesis of 21 quantitative studies indicates that students in mixed-age and single-age classrooms demonstrate approximately equivalent academic outcomes. Way (1980) and Johnson (1985) reach the same conclusion. Reporting on a study in two schools in Texas and drawing on about 40 other studies involving nongradedness, Otto (1969) concludes, among other things, that differences among teachers persist in nongraded as well as graded schools, and how teachers instruct and work with children is far more important than any single organizational feature such as gradedness (Goodlad & Anderson, 1987, p. xxii). Similarly, several doctoral dissertations on nongradedness as an aspect of school productivity and effectiveness generally reported mixed results (Goodlad & Anderson, 1987, p. xiv).

Finally, Milburn (1981) studies two schools of similar size, socioeconomic status, and general climate over a five-year period. The experimental school had five mixed-age classes with an average of 25 students per class. Classroom groupings included four sets of age ranges: 6-8, 7-9, 8-10, and 9-11. The control school adhered to traditional age-graded classrooms and emphasized an orderly progression in curricular content. Four standardized achievement tests were administered to students by independent researchers. Although there was little difference in basic skills achievement between students in the two schools, mixed-age classes did score significantly higher on the vocabulary section of the reading test. In addition, the youngest age group in each multi-age class scored higher on the basic skills test than did their age-mates in the control school. Milburn notes that this seeming advantage in a mixed-age group to the younger students may stem from their emulating older students. Milburn also notes that his research suggests that mixed-age classes may be of special benefit to slower learners. Millburn's observation that, in mixed-age classrooms, younger and/or slower learners may emulate older and/or more adept learners offers some links to several lines of basic cognitive research. Although there are insufficient data on the specific effects of ungraded arrangements and mixed-age grouping on cognitive development, Katz (1990) summarizes some research that suggests some theoretical justification for implementing mixed-age grouping of young children on cognitive grounds. One construct employed by cognitive scientists is the idea of "cognitive conflict," or the interactions between those who hold conflicting understandings. Some studies suggest that cognitive conflict arises when a child interacts with children of different levels of cognitive maturity. Work by Brown and Palinscar (1986) and Vygotsky (1978) suggests that optimal cognitive conflict stimulates cognitive growth by challenging children working or playing in groups to assimilate and accommodate new information represented by individual differences in understanding. In short, the ideas of the more mature or better informed group members influence and help to

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"restructure" the thinking of the less informed or the less mature. Theoretically, greater use of mixed-age groupings in school would make better use of this natural tendency of children to learn from their peers.

A related body of cognitive research addresses the ways in which novices learn from experts. For example, research by Brown, Bransford, Ferrara, and Campione (1983) and Brown and Reeve (1985) defines "experts" as more capable people who provide prompts to increasingly advanced solutions, direct leading questions, and cause "novices" to defend or alter their theories. Although much of the expert/novice research focuses on cognitive mentoring between adults (i.e., college professors and college students), some educators suggest that this line of cognitive research provides support for school and classroom grouping practices that bring together children with varying levels of "expertise."

Social and emotional effects of mixed-age grouping. Many of the arguments for nongraded or multi-age grouping structures in schools emphasize the positive social and emotional impacts on students. Indeed, in some cross-case or cross-study analyses, these impacts outweigh documented academic achievement or cognitive growth comparisons with traditional structures. For example, Pratt's (1983) examination of about 25 empirical studies finds modest evidence that multi-age groupings improve academic achievement (see page 44, above); most of the studies are inconclusive on this point. The same research synthesis, however, determines that among the 15 studies where social development was examined, nine clearly favor multi-age grouping and six are inconclusive. Similarly, Miller (1989), author of a handbook for rural educators on the use of multigrade classrooms, reviews 21 quantitative studies on multi-age grouping and concludes that students in multigrade classrooms generally have more favorable attitudes toward their peers and school than students from single-grade classrooms.

Katz and her colleagues (1990) also review the social effects of mixed-age grouping on young children. The majority of studies they examined used experimental methods in which children interacted in mixed or same-age groups and were conducted in classrooms or similar environments where children spent substantial amounts of time. Overall, the evidence suggests that mixed-age group interaction elicits specific prosocial behaviors such as helping, sharing, and taking turns, all important in young children's development (Katz et al., 1990, p. 21). Older children are provided with leadership opportunities, which may be especially important for some at-risk children, and younger children have the opportunity for more complex pretend play than they could initiate themselves (Katz et al., 1990, p. 21).

Other research also supports the social benefits of mixed-age grouping. Brookes (1990) reports on the implementation of multi-age grouping in a summer program. The program's social goals for at-risk kindergarten, first, and second graders were to improve the attendance rate and motivation and decrease disruptive problems. Eighteen percent of the participating children improved their attendance by an average of 7 percent, although the intervention was brief and attendance was not mandatory. However, the most improvement was noted in the areas of attitude toward school and self-esteem (Brookes, 1990). In another study, Johnson (1985) finds that students in mixed-age classes had a greater sense of self-confidence and saw themselves as being more motivated to learn the assigned material than did their counterparts in same-age groups (Brookes, 1990, p. 22). Milburn (1981) reports that children of all ages in an experimental mixed-age school had a more positive attitude toward school than did their counterparts in traditional grade-level groups (Milburn, 1981).

The literature emphasizes that the benefits of mixed-age grouping may apply especially to younger children whose developmental skills are still forming. Mixed-age grouping can minimize the need for grade retention and repetition in elementary school children while engaging pre-school children who otherwise may spend the majority of their waking hours in child care programs (Katz et al., 1990, p. 49). The developmental benefits noted in the literature no doubt affect cognition, and vice versa. Thus, when the youngest school children are members of mixed-age groups, there appears to be a unique interaction between social/emotional factors, cognition, and achievement.

Several areas of concern have yet to be addressed in any direct or conclusive fashion by the literature on mixed-age grouping. Katz identifies four specific areas that would benefit from research: (1) the optimum age range; (2) the proportion of older to younger children; (3) the time allocated to mixed-age grouping; and the (4) appropriate curriculum (Katz et al., 1990, p. 41). Based largely on experience, she offers the following as practical guides for early childhood educators:

- An optimum age range is greater than the customary range in current classrooms, yet not so great that children cannot share interests
- The proportion of older to younger children should be large enough to keep the older children from regressing (i.e., giving the older students license to behave in less mature ways)
- An informal, multidimensional, non-age-based curriculum is most appropriate

Limitations of the research on multi-age groupings and nongraded school structures. The evaluative research cited above, although generally supportive of nongrading, suffers from several flaws that often make it difficult to interpret results. Pavan (1977), for example, notes that future research should assess the actual practices in schools or programs claiming to be "nongraded" to determine if the label is being used appropriately. Goodlad and Anderson confirm that investigators often fail to collect and report evidence that criteria defining nongradedness are being met. They also caution that organizational change is a "gross" variable that is difficult to link directly and causally to student outcomes (Goodlad & Anderson, 1987, p. 216). Finally, the few efforts to evaluate nongraded or multi-age group reform initiatives generally lack rigor and fail to provide adequate statistics on the effects of non-grading.

Despite these shortcomings, Goodlad and Anderson (1987) "find an overwhelming preponderance of evidence and argument to support nongradedness in all its dimensions" (p. xxvii). They point to the lack of counter evidence. For example, no body of research directly argues and "proves" that the graded structure is best or that single-age class groupings and/or self-contained classrooms are preferable. They note that the debate about promotion vs. nonpromotion rarely comes down on the side of nonpromotion and that studies of the effectiveness of competitive marking systems fail to support that aspect of graded schooling. If one views nongradedness as an "enabling device" that essentially offers classroom teachers more flexibility in teaching students, then it is difficult to build a strong case against it.

Barriers to multi-age or nongraded groupings. Despite the lack of rigorous evidence to support its effectiveness, the nongraded or multi-age structure is amazingly resilient, reappearing as an appealing alternative to the conventional structure in almost every decade since 1920. Why, then, are there so few successful and enduring examples of this reform? There are a number of constraints to implementing this type of structural change. Bredekamp of the NAEYC notes that "teachers have been trained to think in terms of discrete grade structures" (Cohen, 1989, p. 14). They have spent their entire professional lives identifying themselves as a "third grade teacher" or "a fifth grade teacher." Few education schools offer courses that directly support working with students of different ages at once, and there are few open classrooms where teachers can practice the needed skills (Cushman, 1990, p. 39). In addition, dealing with primary school children poses special training needs, and elementary school teachers are not currently required to study early childhood education before teaching the early grades--a requirement in Great Britain and an NAEYC recommendation for the future in the United States (Cushman, 1990, p. 39).

Miller (1989) reviews research on the skills required of the "multigrade" teacher and identifies six key variables affecting successful multigrade teaching: classroom organization, classroom management and discipline, instructional organization and curriculum, instructional delivery and grouping, self-directed learning, and peer tutoring. These skills are not notably different than those needed by all teachers. However, Miller argues that teachers working with multi-age groups need more time for organizing and planning.

Another constraint on ungraded or multi-age grouping is the textbook industry, whose fortunes were (and are) geared to selling complete sets of textbooks for each grade level. This approach results in a lack of curriculum materials appropriate for a nongraded environment (Cohen, 1989, p. 14). In the "scope and sequence" curriculum models of the 1980s, children at each grade level are taught in carefully segmented skill areas before graduating to the next grade. These curricula do not translate well in classrooms in which children are of different ages or at different levels of progress (Cushman, 1990, p. 39). Additionally, an increased emphasis on testing that has dominated recent education reform efforts discourages ungraded approaches requiring alternative methods of assessment (Cohen, 1989, p. 2).

These constraints specific to implementing nongradedness operate against a host of more general constraints dealing with efforts to change education at the local level. Teachers face a variety of disincentives to change traditions, including an ambivalence about whether the change will be favorable (Fullan, 1991, p. 121). The disincentives may be especially strong for an innovation such as nongradedness, where there are few models to turn to for guidance.

Mixed Ability Grouping

Mixed ability grouping may involve students of the same age or may cut across age groups. Like mixed-age or ungraded arrangements, deliberate mixed ability grouping can represent a change in the status quo of American education in some subjects and at some levels of schooling. Elementary school reading, for example, is traditionally taught in homogeneous groups. In some districts, however, new policies require that students in all classrooms at a given grade level will be heterogeneously assigned and taught through whole group instruction--at their grade level and in all subjects, including reading. Philosophically, this approach eliminates perceived inequalities in the reading curriculum and instruction received by elementary students. A persistent criticism of reading instruction is that homogeneously grouped, lower-achieving students (often poor or from minority backgrounds) receive a subsistent diet of phonics and discrete skills practice while their higher-achieving peers encounter real text and read for meaning.

However, reading is a special case in the overall elementary school curriculum. In other subjects, such as mathematics, social studies, and science, instruction is typically delivered to the whole class at once. Thus, any form of grouping for mathematics is considered innovative. Most research on the effects of mixed-ability groups focuses on the use of cooperative student groupings in mathematics classes.

At the secondary school level, the grouping debate centers on alternatives to the de facto tracking alluded to earlier. The new grouping reform initiative at this level is known as the "de-tracking" movement--the search for strategies that eliminate placement, scheduling, and counseling practices that traditionally lock students into college preparatory or noncollege preparatory programs.

From the perspective of the quality of students' time in school, reforms placing students in mixed-ability groups potentially affect many variables having an impact on their progress. For example, some proponents of gifted and talented education argue that heterogeneous grouping wastes the time and impedes the progress of the brightest students. Other educators worry that with mixed-ability groups, slower learners will not get the extra time and attention they need to master curriculum content. Reform strategies creating small or large heterogeneous groups may also alter the allocation and distribution of teacher-student contacts and the proportion of time spent on direct instruction.

Despite some educators' reservations about the effects of mixed ability grouping for instruction, the idea is gaining momentum. For example, the recently (1994) reauthorized federal Elementary and Secondary Schools Act (now called the Improving America's Schools Act) allows children ineligible for Title I services to participate in activities funded by the federal compensatory education program. The new rule is, in part, intended to encourage schools to provide remedial services in heterogeneous classes and allow the use of strategies such as cooperative learning (Miller, 1992).

Two specific types of innovations attempting to bring students of different achievement or ability levels together to learn are cooperative learning groups and peer tutoring. Both strategies are widely implemented and verge on being educational "fads." Although some research addresses the effectiveness of these approaches, it is not clear whether their widespread dissemination is well-grounded in an understanding of this research base.

Here, we examine research on the effectiveness of mixed ability grouping--regardless of the specific strategy for achieving that end. What are the arguments for altering traditional, homogeneous ability grouping arrangements, and what impacts do mixed ability groupings have on different types of students? In general, research on the benefits and impacts of mixed ability grouping is even sketchier than that on mixed age arrangements.

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Generic mixed ability grouping strategies. In a recent review of the research on grouping practices, Wilkinson (1989) reports on several studies that examined the impacts of student-led, mixed-ability groups, primarily in mathematics classrooms. These studies focus on student-student interventions as a mechanism for increasing learning time and fostering academic gains. The groups examined were formed to facilitate students' accurate completion of seatwork assignments during class time when they otherwise would work on their own. Wilkinson finds that the data from studies of both elementary and secondary school populations consistently showed that low-ability students benefitted from working in small groups with higher-achieving peers. Some studies also find positive outcomes for the high ability students (e.g., learning how to explain concepts and procedures), but no significant impacts were found on the students of average ability--not surprising because these grouping experiments were generally designed to encourage high ability group members to take responsibility for the productivity of lower-achieving classmates.

Although Wilkinson suggests that heterogeneous small groups enhance learning time, a number of studies she references find negative effects for low ability students. In one case, the low achievers spoke less during verbal exchanges among group members, a situation that makes assessing what they know and understand and providing helpful feedback difficult (Lindow, Wilkinson, & Peterson, 1985). In other studies, low achievers were consistently less adept at receiving and relaying information to help them complete their assignments (Wilkinson & Calculator, 1982; Wilkinson & Spinelli, 1983). Wilkinson concludes that timely teacher intervention, i.e., ensuring groups serve their designated purpose, may be the critical factor in successful use of student-led, heterogeneous small groups.

Cooperative learning. Currently, at the school and district level, student-led small groups--no matter what their specific parameters--tend to be generically categorized as "cooperative learning groups." However, the literature identifies multiple definitions of what cooperative learning is or should be. The most widely disseminated definition is that of Slavin and his colleagues at Johns Hopkins University. The cooperative learning programs that they have developed, piloted, and marketed are specifically characterized by a competitive component in which heterogeneous small groups vie with each other to earn rewards. The competitiveness factor introduces a variable not present in the studies reviewed by Wilkinson and discussed in the previous section.

Slavin, Karweit, and Madden (1989) note that although there are many methods of implementing cooperative learning, only two have been evaluated for at least one semester regarding their effects on standardized reading and mathematic tests: Team Assisted Individualization (TAI) and Cooperative Integrated Reading and Composition (CIRC). TAI and CIRC both combine direct instruction in homogeneous ability groups with participation in four- or five-member mixed ability teams to complete seatwork. All four evaluation studies of these cooperative learning programs used control group designs and found positive effects on test scores (Slavin et al., 1989, p. 30). Ongoing evaluation of the TAI and CIRC programs indicate achievement gains for high, average, and low achievers (Slavin, 1991). According to Slavin, studies of cooperative learning programs similar to those developed at Johns Hopkins confirm the positive achievement effects of cooperative learning (e.g., Sharan et al., 1984; Sharan & Sachar, 1988).

Some researchers and educators take issue with the reward-based aspects of the Johns Hopkins cooperative learning programs. Reviewing the psychological literature on motivation, Kohn (1991) concludes that programs based on extrinsic motivators (rewards, including grades) may work when the learning objective is practice of a learned principle. However, also citing Yale psychologist Robert Sternberg and others, he argues that extrinsic rewards for learning undermine attempts to produce the kinds of learners and thinkers that we want children to become--creative, self-motivated, and intellectually curious. Kohn offers the hypothesis that a combination of challenging learning tasks, allowing students to make key decisions on how to accomplish assignments, and an emphasis on the value of helping each other will produce a true cooperative classroom environment and better learners. He briefly describes one program--the Child Development Project in San Ramon, California--where these principles are being implemented.

In recent months (and perhaps because of misguided or unguided dissemination and implementation strategies for specific programs), cooperative learning and other activities associated with the "detracking" movement have come under attack as being detrimental to high achievers, particularly the 10 percent of students who are called gifted (see, for example, Allan, 1991). In a rebuttal, Slavin (1991) counters that when researching the effects of cooperative learning, he has routinely analyzed achievement outcomes according to students' pre-test scores. He indicates that those in the top third, middle third, and lower third have all gained consistently, similar to students in control classes, as long as the cooperative learning program in use provides group goals and individual accountability. Analyses by Stevens, another Johns Hopkins researcher, also show that effects remain strong for all groups when the scores of the top 10 percent and the top 5 percent of students are examined separately.

In deciding to require nongraded, heterogeneous groupings in all primary classrooms, the Kentucky State Department of Education drew on research by Johnson et al. (1984) that supports the benefits of cooperative learning groups on academic measures for all students, especially gifted students (Kentucky Department of Education, 1991, p. 33). Johnson's findings, reported in *Circles of Learning*, show that high achievers participating in heterogeneous learning groups score higher on retention tests than do high achievers who are part of competitive or individualistic learning situations. (Kentucky Department of Education, 1991, p. 33).

Nonacademic impacts of mixed ability grouping. In addition to arguments that mixed ability groupings foster improved academic outcomes, a number of researchers cite other types of social and developmental benefits derived from integrating higher and lower achievers. For example, Slavin et al. (1989) report that all methods of implementing cooperative learning groups have had positive effects on race relations, acceptance of mainstreamed students, and self-esteem. Similarly, Johnson et al. (1984) note social benefits for gifted students in cooperative learning groups. They indicate that although exceptionally bright students are often resented or ostracized in conventional classrooms, they become desirable partners in a cooperative learning situation (Kentucky Department of Education, 1991, p. 33).

Lew, Mesch, Johnson, and Johnson (1986) explore the effects of cooperative learning on what they call "positive interdependence." Isolated children in cooperative learning groups gained in achievement, interpersonal attraction, and in the use of collaborative skills. The researchers argue that by acquiring collaborative skills through cooperative learning groups, the isolated children developed their self-confidence, which in turn resulted in more peer interaction (as cited in Katz et al., 1990, p. 32).

Miller's (1989, p. 206) synthesis of findings from a number of studies also documents positive social, emotional, and developmental effects of cooperative group work. More than 30 of the studies that he reviewed demonstrate that cooperative learning groups improve student social skills and increase the variety of strategies needed to work cooperatively with others, including problem solving, empathy, willingness to give and receive help, communication skills, and rewarding the behavior of fellow classmates (Johnson et al., 1984; Kagan, 1989). Kagan also notes that students in cooperative learning situations seem more internally motivated and in control of learning than students in traditional classrooms.

Peer and cross-age tutoring. Some types of tutoring programs closely resemble cooperative learning. Tutoring and mentoring programs often take place outside of normal school hours and involve college students or adults working with elementary or secondary school students. We treat these types of interventions in Chapter 3 of this research review--Out of School Uses of Time. Here, we focus on the benefits of in-school tutoring situations in which (1) both the tutor and the tutee are within the age range served by a given school and (2) the tutoring sessions focus on academics.

Some of the arguments for the use of peer tutoring are intuitive. For example, according to Bowermaster (1978), peer tutoring can alleviate three causes of school failure: fear, boredom, and confusion. First, peer tutors are less threatening to tutored students and place less pressure on them than teachers. Second, students generally enjoy working with friends and classmates as a change from the typical teacher-talk-students-listen instructional paradigm. Third, because they are peers, the tutor and the tutored speak a common language, which may reduce academic confusion.

Several researchers indicate that peer tutoring incorporates many positive elements found in cooperative learning groups (Johnson, Johnson, Holubec & Roy, 1984; Russell & Ford, 1983; Slavin, 1987, as reported in Katz et al., 1990, p. 30). Specifically, these common elements include students interacting face-to-face and sharing responsibility for learning, shared leadership and positive interdependence, and individual accountability in promoting academic achievement (Katz et al., 1990, p. 30). Research into the effects of peer tutoring, as in cooperative learning, indicates both academic and social gains.

Cohen, Kulik, and Kulik (1982) analyze 65 studies of school tutoring programs, indicating that the majority of programs positively affected the tutored students' academic performance and attitudes toward tutoring (Katz et al., 1990, p. 29). This meta-analysis focused on studies of tutoring programs in elementary and secondary schools and compared outcomes by several variables, including:

- Structured vs. unstructured approach
- Supplementary vs. substitute instruction
- Same age vs. cross-age pairs
- Program duration
- Subject matter focus
- Average ability level of participants

The authors find that in 45 of the 52 studies in which achievement growth was measured, tutored students outperformed control groups of students not tutored. More program structure and a relatively short timeframe (measured in weeks) appeared to affect participants greatly. Gains were more visible for mathematical tutoring sessions, and locally developed assessment instruments were more sensitive to gains than nationally normed, standardized tests. Tutoring also had a positive effect on students' self-concept and attitudes toward subject matter.

A number of studies suggest that both the tutor and the tutored benefit from participating in tutoring activities. For example, a research team headed by Ronald Lippitt reports that (1) both tutors and tutees showed academic gains and (2) tutors showed improved attitudes and interest in school, increased ability to get along with others, and increased self-respect and belief in their own ability (Kentucky Department of Education, 1991, p. 33). The Cohen, Kulik, and Kulik meta-analysis also notes positive outcomes for the tutors, including higher test scores and stronger self-concept. One evaluation of a high school tutoring program uncovers an unexpected outcome: some tutors turned their newly learned skills into profit through out-of-school tutoring jobs (Cotton, 1988).

The term "reversal peer tutoring" is used to describe programs in which low achieving students tutor other low achieving students, with the expectation that both groups will benefit. In one project (Chandler, 1980), alienated junior high school students tutored second and third graders. Teachers reported an improvement in academic performance and attitude toward school for 81 percent of the teenage tutors.

Detracking. Overall, the research literature reviewed above suggests that the strategic use of mixed ability or achievement groupings can enhance outcomes for students of all ability levels. However, this literature largely evaluates heterogeneous groupings that engage students for portions of the school day or week. It does not directly address experiments with full "detracking," which are just beginning to be implemented and have not yet been systematically evaluated. The detracking experiments described by Oakes and Lipton (1992) in a recent article are part of long-term, multifaceted school or district restructuring efforts, involving consensus-building, curriculum reforms, and innovative kinds of instructional practices such as team teaching. Where it is being tried, detracking is proceeding from the hypothesis in the research findings that tracking is detrimental to all students, but particularly to poor and minority students. However, no one yet knows what effects detracking will have on desired student outcomes such as improved test scores, engagement with subject matter, attitudes toward school and classmates, and school completion rates. Following the development of this kind of reform initiative will be of great interest to our evaluation of the quality of students' time in school.

Implementation issues. The literature on heterogeneous grouping does not address the practical issues of how to structure the school day, week, and year around the use of mixed ability groups. Strategies such as cooperative learning and peer tutoring are most often used in combination with homogeneous grouping arrangements. The best advice to teachers emphasizes "flexibility." In her review of the research literature on within-class grouping, Wilkinson (1986) concludes that one essential element of successful grouping is flexibility: "Teachers should not be reluctant to reassign students to groups and even alter the groups themselves. Students change, and classrooms are in flux throughout the school year. Groups should be changed, added, deleted, as indicated. Most importantly, teachers should reassign students to different groups if that is appropriate for the students."

Cushman (1990) reinforces the idea of flexibility and offers practitioners some specific pointers for creating a variety of different types of groups that allow students the opportunity to advance at their own pace, tutor others, and mix with different children:

- Problem-solving groups--in which students are grouped around a common unsolved problem or topic (e.g., a group discussion about the main idea of a story
- Needs requirement grouping--students are instructed in a concept, skill, or value (e.g., introduction of a new mathematical concept)
- Reinforcement grouping--for students needing more work in a specific area, such as vowel sounds
- Interest grouping--for students wanting to explore a common interest (e.g., readers interested in poetry)
- Learning-style grouping--for students with a common pattern of learning (e.g., through manipulative objects)

In short, classroom groupings should be flexible and designed to meet students needs as the school year progresses, rather than rigid and unchanging throughout a child's educational career.

The barriers to implementing mixed ability grouping practices are similar to those for mixed age classrooms--accountability considerations, a lack of adequate curriculum materials for teachers to use with diverse groups, and a lack of professional development opportunities for teachers to learn how to use different grouping strategies.

Scheduling

Changing the ways in which students are grouped is one strategy for significantly altering the quality of students' time in school. Another is innovative scheduling. The typical school day, particularly at the secondary level, is rigidly divided into rather short periods of time that often constrain teaching and learning. Even in elementary school, daily schedules frequently revolve around the lunch schedule and "specials" (e.g., art, music, physical education, drug awareness programs, etc.). In recent years, two alternative scheduling plans--macroscheduling and parallel block scheduling--have begun to find favor with some educators. Each plan attempts to improve the quality of students' educational experiences within what is considered the normal school day and year, and within the provisions typically negotiated in teacher contracts. Below we briefly describe each.

The Copernican Plan (macroscheduling). Joseph M. Carroll's "Copernican Plan" proposes to reorganize high schools so that school reforms that may bring about effective student learning can be successfully implemented. As described in Carroll's book *The Copernican Plan: Restructuring the American High School* (1989), this innovation involves several different proposals, none of which are new, but which, when implemented concurrently, create a new model of an effective high school. The cornerstone of the Copernican Plan is a different type of scheduling for teachers and students, referred to as macroscheduling. In theory, it allows for more intensive and thorough coverage of subject matter than is possible through the typical high school schedule.

The Copernican Plan assumes that a completely redefined school schedule will lead to better instructional practices. The typical high school student currently enrolls in six classes each semester that meet for about 50 minutes each day over a 180-day school year. Carroll proposes that a student follow one of two alternative plans that both fulfill the required 180-day school year:

- Students enroll in one four-hour class each day for a period of 30 days. Each student enrolls in six of these classes each year; or

- Students enroll in two two-hour classes at a time for a trimester of 60 days

A school could adopt both types of classes simultaneously and be flexible in the length of its "macroclasses" (p. 25).

Citing relevant educational research, Carroll argues that his plan will result in improved knowledge retention, more individualized instruction, a greater capacity to deal with complex issues, and improved student conduct. Many of these improvements are possible because the new scheduling establishes conditions under which students can engage in learning activities with less disruption. Additionally, teachers gain time for instructional planning (pp. 29-33).

A recent evaluation of the Masconomet Regional High School Renaissance Program (Whitla, Bempechat, Perrone, & Carroll, 1991), which is experimenting with the Copernican Plan, focuses on a program in which students in one of two schools-within-a-school enrolled in two 100- to 118-minute classes each day for three trimesters. Classes met for about 18 to 28 percent less time than in the traditional program involving 46-minute classes. Teachers in the Copernican Plan taught substantially smaller classes. The evaluation concludes:

- The Copernican Plan format "encouraged teachers to be more innovative in their pedagogy," making more use of group learning activities than traditional teachers (based on classroom observations)

- There were few significant differences in academic performance between Copernican Plan students and those in a control group, indicating that the Copernican format fostered as much learning as did the traditional program, despite substantially less total class time

The evaluators emphasize that standardized achievement tests inadequately measure important differences between traditional and Copernican scheduling formats. These differences include a more personalized relationship between students and their teachers, more individualized instruction, more writing, and the pursuit of issues in greater depth (p. 55).

The broadest implementation of macroscheduling (it is not referred to as the Copernican Plan in this context) is in the network of secondary schools formed by Sizer called the Coalition of Essential Schools. Macroscheduling is one of nine common principles guiding all member schools, serving primarily as a structural change to support the curriculum principle that "less is more"--i.e., decisions about what to teach should be guided by the aim of thorough student mastery and achievement rather than by an effort to cover content (Coalition of Essential Schools, n.d., p. 1). Of the 120 member schools, most have rearranged scheduling in some way, often involving increased time allocated to individual or integrated subject areas (telephone conversation with Nonie O'Farrell, Membership Coordinator, Coalition of Essential Schools, January 28, 1992).

According to the Coalition of Essential Schools, most evaluations to date focus on the overall restructuring of member schools. Macroscheduling, as such, is a tool for achieving broader goals and has not been singled out for evaluation.

Parallel block scheduling. As described by Robert Canady (1990), parallel block scheduling redefines the elementary school schedule--specifically the scheduling of support services and the use of seatwork time--to permit uninterrupted small-group instruction for all students every day. In a typical self-contained elementary school classroom, students spend up to 70 percent of their time on independent seatwork, and the scheduling of support services often interrupts instruction (Canady, 1990, p. 34). With parallel block scheduling, each teacher works with two student groups. While one group participates in instructional activities, a second group moves either to another classroom for support services or to another area for enrichment activities such as creative writing, computer instruction, literature appreciation, or others. During the other portion of the time block, the two groups trade places. Instruction occurs continually for all students throughout the entire time block.

According to Canady (p. 36), the benefits of parallel block scheduling accruing to all students include:

- Equal amounts of instructional time in reading and mathematics
- Teacher-directed instruction unbroken by pullouts
- Instruction in both heterogeneous and homogeneous groupings during the school day
- Less unsupervised seatwork activities
- Increased small-group instructional time in both mathematics and reading

In addition, Canady notes that by moving large groups simultaneously, parallel block scheduling reduces the stigma of individuals leaving the classroom to receive special instruction (p. 35).

Technology and the Quality of Time in School

In this section, we address the potential of technology for improving the quality of instructional time in schools. Our main focus is on computers because there is more research and evaluation available on effective use of this technology as a learning tool. First we review the current status of computers and related technology in schools, as well as studies of the effectiveness of computer-based instruction. We then address the technology's potential to greatly enhance education; here, we broaden the discussion beyond computers and examine the educational applications of some other promising but less widespread technologies. Of particular interest is the relatively recent emphasis on the relationship between technology and restructuring to advance effective teaching and learning. Finally, we briefly review some barriers to the effective use of the technologies available to schools.

Current State of Technology in Schools

Over the past decade, computers have become a common part of the school environment in this country. The number of computers used for instructional purposes in K-12 schools tripled during the first half of the 1980s (Schmitt, 1990, p. 1). More than 91 percent of all school districts have at least some computers (Olson, 1992, p. 2). Other types of newer technologies are also becoming more prevalent. Videocassette recorders are available in 94 percent of schools nationwide; distance learning projects are under way or in the planning phase in virtually every state (Olson, 1992, p. 2). Still, compared with the rapid technological transformation of life outside the classroom, the schools have not kept pace: ". . . if the total number of telephones, faxes, televisions, computers, and other forms of communications technology now available in schools were computed nationwide, for the most part the school sector would compare to that of a developing nation" (Shelly Weinstein, president of EDSAT Institute, as quoted in Olson, 1992, p. 2). Not all students use computers, and those who do average only 4 percent of their instructional time using them (Olson, 1992, p. 2).

Several authors on the topic of technology in education note that as technology enters all other aspects of life, it will inevitably infiltrate schools as well (David, 1991; Collins, 1991; Sheingold, 1991). According to these authors, the question for educators and policymakers is not *whether* technology will invade the classroom, but whether it will be used to produce significant changes in teaching and learning.

So far, the use of technology in schools has rarely changed traditional approaches to teaching and learning. As John Gibbons of the federal Office of Technology Assessment stated in the late 1980s, "Schools have acquired computers rapidly, but most elements of the instructional process remain the same" (Olson, 1992, p. 1). Typically, the use of computers is limited largely to courses in programming and computer literacy in secondary schools and for drilling on basic skills, isolated learning games, or reward activities in elementary schools (Sheingold, 1991, p. 20; Council for Basic Education, 1991, p. 4). According to the Council for Basic Education (1991, p. 3), the introduction of computers and related technology has suffered the same fate of past innovations such as the tape recorder, educational television, and various other learning machines because the new technology has been added to the existing classroom as just another novelty rather than as a tool that could be truly integrated into the curriculum. It is rare when instruction takes advantage of the computer's unique features. Even when the computer is used to meaningfully enhance instruction, it is viewed as "experimental" or as a separate part of the curriculum (CBE, 1991, p. 3).

Only recently have computer applications such as word processing, database management systems, spreadsheets, and graphics programs started to appear in some classrooms and schools. For example, the growing popularity of the whole language approach, with its heavy focus on writing activities for even the youngest students, creates a natural setting for the use of computers as word processors. Some educators are also beginning to integrate computer use into subject matter teaching (Sheingold, 1991, p. 20). As new software such as encyclopedias on disk become more widely available, this trend is likely to escalate.

Evaluative Studies of Computer-based Instruction

Computer-based instruction is the primary technology addressed in the more recent research literature. The following section describes some recent reviews of the effects of computer-based instruction on both student learning and on teaching. Studies addressing student learning have been concerned with the effects of computers on student outcomes (such as test scores or the ability to understand a concept or acquire a skill) and the changes in the process of student learning (such as whether students are engaged for more or less time). The more recent research tends to focus on the process of learning, particularly on efforts to integrate computers more wholeheartedly into the school or classroom. Some recent studies also address the effects of computers on the process of teaching.

Effects on student outcomes. Eisenberg (1989) conducts a meta-analysis of a total of 254 comparative studies of computer-based instruction: 48 in elementary schools, 51 in high schools, 123 in universities, and 32 in adult education settings. The studies cover use of the computer in computer-assisted instruction (CAI), including drill and practice and tutorial instruction, computer-managed instruction (CMI), and computer-enriched instruction (CEI), including use of the computer as a calculating device, programming tool, and simulator. All studies are controlled, quantitative studies. Eisenberg reports (p. 157) that students generally learned more in classes in which they received computer-based instruction. In the 254 studies with examination results, the average effect raised scores from the 50th to the 62nd percentile. Use of computers did not have positive effects on some variables such as course withdrawals. Eisenberg notes that the results reported by the studies may be influenced by experimental design flaws, effects of the novelty of computer-based instruction on student performance, and a tendency of editors to publish positive results and ignore negative effects (p. 158).

Slavin et al. (1989) review several studies of CAI as a pullout program for students needing remediation. He notes that both the largest number and highest quality of evaluations involve reading and mathematic programs developed at Stanford University in the early 1970s and currently disseminated by the Computer Curriculum Corporation (CCC). Slavin indicates that, overall, results for CAI programs, especially CCC programs, "are well established and positive, though in the best controlled studies they are usually modest in magnitude and appear more frequently on basic skills than on higher order skills" (p. 70).

Slavin and his colleagues also compare CAI to tutoring of students by adults, noting that the costs for both are high. They find that working in a one-to-one relationship with an adult tends to have larger effects in studies of similar methodological quality (p. 70).

Schmitt (1990) reviews empirical studies of the efficacy of CAI in various settings (computer laboratories, as well as both remedial and nonremedial instruction), with particular attention to its use in teaching mathematics skills and concepts. He reports that, in general, CAI seems to be at least as effective as conventional instructional methods, but cautions that the superiority of CAI has been demonstrated in only a limited number of studies. Schmitt also suggests that the failure to demonstrate statistically significant results favoring CAI may be the result of design flaws such as small sample sizes, limited study duration, lack of knowledge of the software quality, and misused or overused statistical procedures.

Pogrow (1989) developed a computer-based program to teach higher order thinking skills to disadvantaged students in Chapter 1 programs. The Higher Order Thinking Skills (HOTS) Program combines commercially available software for Apple II computers with teacher training in Socratic questioning methods to stimulate metacognition, inference, decontextualization, and synthesis of information. The results are impressive. In pilot sites, participating students, on average, gained 10 NCEs in reading and 11 NCEs in mathematics on fall-spring pre- and post tests. In one school, students posted average gains of 5.6 years on the Stanford Diagnostic Reading Test, and 20 percent of the participating fifth and sixth graders tested beyond the high school level. This program seems to have tapped some of the real potential of the medium.

Effects on the process of learning and teaching. The Eisenberg review cited above also draws some conclusions about the effect of computers on the process of learning. Eisenberg reports that computer-based instruction appears to give students a new appreciation for technology and has positive effects on their attitudes toward school and teaching (p. 157). Specifically, Eisenberg reports the following:

- Students learned their lessons with less instructional time. In 32 investigations of this variable, the average reduction was 30 percent.
- Students liked their classes more when they received computer help

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- Students developed more positive attitudes toward computers when they received computer help in school

Collins (1991) identifies several major trends in the use of computers from the literature and from observations in schools. Many trends emerge from studies of the Apple Classroom of Tomorrow (ACOT) and the Discover Rochester Project, both involving special efforts to integrate technology, especially the computer, into the curriculum. Notable trends include:

- A shift toward more engaged students. In settings where students have access to computers as part of a long-term activity or project, researchers report dramatic increases in student engagement.

- A shift from the primacy of verbal thinking to the integration of verbal and visual thinking. Computers and electronic networks provide instant access to knowledge in both verbal and visual forms.

- A shift from all students learning the same things to different students learning different things. Electronic networks and shared databases foster a view of knowledge in which expertise is spread among participants and brought together in a common space, in contrast to the notion that everyone must learn the same thing in the same manner at the same time.

- A shift from whole class to small-group instruction. When teachers use computers, one or two students are assigned to a computer. Unable to keep all students at the same place in a computer program, teachers must adopt a more individualized method of teaching.

- A shift from lecture and recitation to coaching. Most learning is meant to take place between the computer and the individual student, so the teacher becomes an observer and guide, ensuring that the interaction is beneficial to student learning.

- A shift from working with more able students to working with less able students. In whole class instruction, teachers tend to carry on dialogue with the abler students. In a classroom in which students are working on computers, the teacher is drawn to students who need help, generally the weaker students.

- A shift from assessment based on test performance to assessment based on products, progress, and effort. For example, in one study, the computer system would not let students continue until they solved each problem. The teacher thus moved toward assessing each student on the effort and progress they made.

- A shift from a competitive to a cooperative social structure. A number of studies have noted a shift toward a more cooperative social structure (such as sharing and discussing notes, ideas, and expertise) in classrooms where a network provides a common database for students.

Sheingold (1991) also comments on the effects computers have on teaching. She reports that in a recent survey of teachers selected because of their accomplishments in integrating technology into teaching, most believe that their teaching has changed in positive ways as a result of using computers. They report an increased ability to present more complex materials, more tailoring of student work to meet individual needs, and an increased tendency to act more as coaches than as information providers (p. 20).

Finally, Stephen Kerr (1991) interviewed classroom teachers as part of an evaluation of a specific technology-based program of classroom and school renewal. He finds that technology physically transformed the participating classrooms in ways that reduced the time teachers addressed students from the front of the room and caused a shift to more project activities and independent learning. In several cases, teachers reported working longer with weaker students.

The Potential of Technology in Schools

Although the typical use of computers in schools has been less than pathbreaking, there are many visions of what this technology might do to improve teaching and learning. Recent efforts to describe the potential role of technology in improving education share the premise that both teacher and student must redefine their traditional roles. David (1991) puts it as follows:

> "A teacher facing students seated at computers learns quickly that he or she cannot conduct business as usual. Students turn to one another for answers to questions; teachers, who may feel threatened at first, end up turning to students; no one knows everything. Suddenly, expert knowledge is spread around, and the teacher is no longer the sole authority in the classroom" (p.78).

Technology can also free up teachers' time for learning new roles by assisting them with some of the more time-consuming and complex traditional chores (such as assessment).

Teacher as manager of multiple sources of learning. Branson (1987) proposes a technology-based educational system in which the teacher manages a system containing multiple sources for student learning. The center of this paradigm is a computerized database of knowledge. The teacher and students all interact with the core as well as with each other, learning from one or all of the available sources. The teacher no longer "delivers" instruction directly to students, but rather plans, manages, and monitors student learning along with other staff. The teacher also becomes a student, learning from students and other staff. (Council for Basic Education, 1991, p. 7).

Active learning and adventurous teaching. Sheingold (1991) also has a vision of how technology--more broadly defined than computers alone--could change education. She argues that although future technologies might offer unimaginable possibilities to education, those currently available can support "active learning and adventurous teaching" (p. 20). She cites the following examples of how technology can transform teaching and learning, assuming students are much more than passive recipients of instruction "delivered" by the teacher:

- Computer software tools such as word processors and graphing tools can help organize and structure complex tasks for students
- Video and videodisc technologies can provide visual examples of real world events and phenomena that students can use in problem identification and problem-solving activities
- Computer networking and satellite communication can promote local and long distance collaboration among students and teachers and link them to the larger world of scholars and scientists
- The production capabilities of computers and video cameras enable students to easily share and revise professional products of their own design
- Some computer software can help students monitor and manipulate their own thought processes as well as demonstrate difficult concepts
- Other software allow students to simulate complex scientific, economic, or historical data and explore the variables and relationships constituting the phenomena.

Technology assisting teachers with traditional role. David (1991) describes several ways technology can assist teachers in some of their more time-consuming and complex tasks. The computer can simplify management and record keeping for instruction and administration, thereby freeing up time for more substantive work. David notes that, in addition, other technologies such as videotape can be used to enhance communication with parents or to provide teachers with training not ordinarily available in their district. Further, with the potential to synthesize and display complex quantitative and qualitative data from a variety of sources, technology can assist teachers in developing and conducting more meaningful and personalized student assessment such as portfolios (p. 79).

The Council for Basic Education (1991) offers its own vision of how technology might transform the role of teacher from provider of knowledge to manager of a highly specialized learning environment, with the computer assuming many tasks formerly undertaken by the teacher. The Council envisions an educational system driven by what students are expected to know and be able to do, in which the curriculum would be translated into computer-monitored segments through which students move developmentally (p. 8). Sophisticated programming will allow each student to progress at the appropriate rate, branch for repetition, re-present a lesson, or move on to another concept after mastery. The computer would keep the teacher informed of each student's needs and achievement, allowing the teacher when necessary to pair students with similar needs who can assist each other, or plan enrichment activities to expand students' understanding. Progressing at their own pace, students will participate in projects appropriately timed for optimal understanding and closely monitored by teachers. When this vision is implemented, the Council asserts, "Current problems such as tracking, grade placement, and special treatment for the gifted will disappear as issues."

The potential of other kinds of technology. Obviously, computers are not the only technological advance with implications for improving education. One innovation that has particular potential for improving rural education is distance learning. Available to even the most remote schools for decades, instructional television has served a purpose. However, the television teacher, physically unconnected to students, is an imperfect solution to the curriculum and teaching resource needs in schools. Newer developments in "distance learning" hold far more promise.

Current technology such as fiber optic cables, satellite links, two-way video transmissions, electronic mail, and fax machine systems increasingly help small school districts expand their academic range. According to the Office of Technology Assessment (1988), 35 states have some type of distance learning program employing some or all of these technologies. In one area of Minnesota that we have visited, seven small rural districts are linked through fiber optic technology, which allows them to upgrade their high school programs by sharing teachers for foreign languages and higher level mathematics or science courses. A Spanish teacher, for example, offers Spanish II in a classroom with eight video monitors and three cameras. Some of her students are in the same room with her; others are miles away in rooms also equipped with monitors, a camera, a microphone, and a telephone. The teacher is able to monitor the attention of students in the remote classrooms (where an aide supervises the group), and they can pose questions directly to the instructor. At the end of the period, students fax homework or tests to the originating classroom.

Restructuring and Technology: The Connection

Making the most of educational technologies in schools and classrooms clearly means more than simply having the hardware and software available. In fact, some of the researchers and analysts we have cited argue for a direct link between better uses of technology and the numerous restructuring or systemic reform initiatives under way in many school districts.

David (1991) describes restructuring as a systemic attempt to "transform the current education system into one capable of providing students with the kinds of skills they need in today's world and the world of tomorrow. This means not simply changing what schools already do, but changing school practice fundamentally" (p. 38). She notes that the governors of all 50 states have made commitments to restructure their school systems, that executives from 200 of the largest U.S. corporations have made ten-year commitments to assist restructuring efforts in all 50 states, and that technology will come to play a powerful role because of its potential to transform teaching and learning in the restructuring process.

Sheingold (1991) makes a similar argument, maintaining that the agendas of active learning, technology, and restructuring need to be pursued concurrently to be maximally effective (p. 17). Specifically, she notes that restructuring and technology go hand-in-hand because once teachers begin to use technologies well to advance student learning, they often:

- Need more time to learn about, train in, and plan for the use of technology
- Want students to have longer blocks of time in which to complete their work
- Want to integrate curriculum and team teach
- Need greater access to technologies for themselves and their students

In short, the barriers to using technology effectively are precisely "what teachers in restructuring districts have (or are supposed to have) the authority to change" (p. 21).

Summary

We have used three "hooks" to begin our exploration of quality of time in school issues: (1) the impact of year-round schedules on learning, (2) the strengths and weaknesses of traditional and nontraditional grouping or scheduling practices, and (3) the potential of technology in educational settings. Based on the results of the research review, we are convinced that innovative experiments in these areas are part of the reform equation. It will not be difficult to identify sites where a year-round schedule, an ungraded structure, peer tutoring, macroscheduling, cooperative learning strategies, or sophisticated uses of technology are being implemented.

The real challenge for our evaluation of reforms involving the quality of time in school will be attributing impacts or effects to the manipulation of a given time-related variable. In the current climate of restructuring, for example, implementing a new grouping or scheduling strategy is nearly always just one piece of a reform gestalt. If positive outcomes of the reform are documented, does the ungradedness or the macroschedule explain a major or a minor part of the improvement? Further, it is no accident that the research literature on grouping practices is rife with mixed results and no results in student achievement. We were struck by the number of studies in this area in which the investigators blamed the insensitivity of measurement instruments for the lack of impacts. In addition, advocates of some grouping and scheduling reform strategies value the often-documented social, developmental, and affective outcomes in and of themselves, believing that impacts in these areas must, ultimately, affect learning in some undefined way.

In this review, we have obviously addressed some but by no means all the topics relating to the quality of time in schools. Two particularly glaring (but deliberate) omissions in our research review are (1) the quality of teachers' time in school and (2) curriculum issues about what can or should be taught given a finite amount of time in the school day, week, and year. Research reviews from other projects sponsored under OERI's Studies of Education Reform Program (SERP) will partially fill these gaps. In addition, the Uses of Time Study has commissioned or prepared several other kinds of products to address certain aspects of these issues. These products are listed on the back inside cover of this volume.

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CHAPTER 3: USES OF NONSCHOOL TIME AND ITS IMPACT ON ACADEMIC ACHIEVEMENT AND SOCIAL DEVELOPMENT AMONG YOUNG CHILDREN AND ADOLESCENTS

> *"In the nineteenth century the knowledge inside the schoolroom was higher than knowledge outside the schoolroom. Today it is reversed. The child knows that in going to school he is in a sense interrupting his education."*
>
> *–H. Marshall McLuhan*

Introduction

This section of the literature review examines some of the research on the uses of time that are educative and occur outside of schools. To begin, we must first clarify what we mean by "educative" and establish the parameters of our subject. Lawrence Cremin's definition of education is helpful in this effort. He defines education "as the deliberate, systematic, and sustained effort to transmit, evoke, or acquire knowledge, values, attitudes, skills, and sensibilities, as well as any learning that results from that effort, direct or indirect, intended or unintended" (Cremin, 1988). This broad definition of education alerts us to the wide variety of "educators" that students encounter and tends to emphasize the dramatic changes in total educational terrain throughout American society suggested by McLuhan's opening quotation.

A broad definition of education helps explain why a study of nonschool time is important, but the emphasis on "deliberate, systematic, and sustained" efforts helps us isolate what is educative and what is not. For purposes of this review, our emphasis is on the kinds of deliberate activities most commonly believed to enhance, or have the potential to enhance, academic performance as well as social and emotional development. However, we have not developed an exhaustive list. Instead, we offer a sample of the research on nonschool activities to highlight both what we know and what we don't know about students' uses of nonschool time.

From a policy perspective, our broad view of education makes it difficult to differentiate between education policies and a variety of other social policies like family policy, cultural policy, or work policy. This is appropriate if we understand that students learn from a dizzying array of sources. Therefore, it is with this perspective that we draw the parameters of our review of the research. Our focus is on school-age youth and is generally confined to easily recognizable programs or practices. Although this review will occasionally lead us to point out some of the broader policy issues, we approach the research with an awareness of the sweeping changes that nonschool education has undergone recently.

Since World War II, American society has undergone a dramatic change in the rearing of children. That change is a result of a combination of factors, including shifting demographics and increasing cultural and racial diversity, structural changes in the family, the diversification of child care arrangements, and the pervasive presence of television. None of these changes is necessarily a barrier to children's school performance, but combined they represent a fundamental change in the educative influences on children today (Cremin, 1980).

A brief look at just one of those changes--television--helps illustrate the magnitude of change and importance of research on the uses of nonschool time. In 1950, only 10 percent of American homes had a television; by 1980, 98 percent had television (Cremin, 1988). Those sets are watched an average of seven hours a day (Winn, 1985, p. x). Many observers have noted the increasing amounts of time allocated to television viewing, but researchers are only now beginning to understand the effect of this practice.

Caplow and his associates (1982) suggest that by targeting adolescents as a special market, television increases the separation between adult society and adolescent society. As a result, the potential for conflict is raised between adolescent and parental values and attitudes. Other researchers have examined the differences between learning from television and learning from other sources. For example, Char and Meringoff (1981) find that children learning a story from television remember less of the story and draw fewer personal inferences than do children learning the same story from a book.

At the same time, television has occasionally demonstrated its ability to dispense formal education. The shows produced by the Children's Television Workshop (CTW) illustrate the ability of television to teach some prereading, reading, beginning mathematics, and science skills to millions of children. *Sesame Street*, in particular, has targeted poor children unable to attend preschool. Although research found that the programs clearly improved skills, they could not completely close the educational and experiential gaps between rich and poor children (Cremin, 1988, p. 364).

The quantity of television Americans now watch attests to just one aspect of the changed "ecology of education" of the post-World War II period. Similar descriptions of sweeping change have been written about the family, the workplace, and technology--all key educators. Therefore, although this review focuses primarily on specific programs and practices relating to nonschool education, it is conducted with an eye toward the changes in the broader environment. This chapter will examine some nonschool activities and summarize research findings on the effect of those activities on students' intellectual and social development. It is one small step in synthesizing a literature that is just developing, an area of concern sorely neglected in the current wave of reform.

The Quantity of Nonschool Time

To determine why some students attain greater academic success or demonstrate higher levels of social skills, maturity, or responsibility than their peers, many researchers and educators have begun to examine closely the activities that young people are engaged in during nonschool hours. Most research to date has focused on determining the types of extracurricular activities positively or negatively associated with growth and achievement, although relatively few researchers have tried to identify the specific processes and factors during these activities that interact to produce a particular outcome (Brown, 1988; Clark, 1983; Holland & Andres, 1987). Thus, although there has been a great deal of research on the extracurricular activities of students, most studies suggest correlations, not causation. This paucity has prompted many in the field to call for more focused research--in other words, research that not only identifies the types of activities that are best, but also suggests how the process of participation helps or hinders specific outcomes. Through this level of analysis and information, parents, counselors, and others concerned with youth development could more effectively structure and plan activities for different groups of youngsters with particular goals in mind.

How and where students spend their nonschool hours varies widely because they are influenced by social and economic factors and by personal interests and abilities. The *Gallup Study of America's Youth, 1987-88* reports that 72 percent of teenagers in 1988 listed visiting friends, watching television, going to the movies, dating, partying, and dancing as their favorite pastimes (Bezilla, 1989). Only 20 percent of the sample listed activities such as staying home with the family, reading, playing sports or exercising, listening to music, playing games, or studying. Another survey--*Youth Indicators 1991*--reports that "the most common leisure activity of high school seniors in the class of 1990 was watching television" and "less than one-half of all high school seniors read each day" (U.S. Department of Education [ED], 1991). These statistics are cause for concern among parents and educators because the most popular activities reported are among those least associated with intellectual or social development.

In his research and analysis of achievement levels among disadvantaged students, Reginald Clark concludes that children's success or failure in school is determined by the amount of time they engage in "constructive learning" activities (Clark, 1990). The average student spends only 270 to 480 hours engaged in classroom learning each year, a relatively brief period of time considering all they are expected to learn and master (Clark, 1990). Clark found that high achievers are engaged in intellectually stimulating activities for approximately 25 to 35 hours of the 60 to 70 waking hours available to most children per week. These activities include "deliberate out-of-school learning activities" such as homework, tutorials, part-time work, internships and apprenticeships, and "high-yield leisure activities," which entail reading, writing, verbal communication, problem solving, and decision making. Clark also includes interacting with knowledgeable adults, participating in organized youth activities, and attending cultural events as "high-yield" activities. Other recreational activities, such as watching television, playing sports, dating, and attending parties were not included in the group of activities promoting mental stimulation or extending the practice of cognitive skills.

In this chapter, we will focus on what is taught during the other waking hours, and how this knowledge is related to academic achievement and/or the development of desirable personality and social characteristics. In many instances, however, limited research has been completed, and in some cases, the results are somewhat contradictory or inconclusive. Thus "we understand very little about specific experiences outside of school that influence student performance, less about why these experiences have the effects that they do, and even less about the circumstances under which these factors have stronger or weaker effects" (Steinberg et al., 1988).

Notwithstanding these limitations, there is much to be learned from current studies, and even those with contradictory findings may facilitate future research by helping to clarify the questions that need to be asked. For example, the importance of clearly defining an activity before seeking to investigate its impact is illustrated in several instances. Thus, one cannot simply investigate the impact of community service, homework, or employment as single entities; instead, one must examine the nature of the community service, the type of homework assignment, or the specific job requirements to accurately ascribe an effect or impact of these activities.

In the following sections we will summarize research findings on the impact of each of the following: (1) family life; (2) "latchkey" programs and other afterschool child care arrangements; (3) participation in tutoring and homework assistance programs and other organized intellectual enrichment activities; (4) membership in youth clubs and organizations; (5) sports and other extracurricular school activities; (6) community service; and (7) part-time employment and apprenticeships. Although the amount of research and analysis conducted in each area varies widely, the overall picture that emerges points clearly to several major factors contributing in important ways to the social and intellectual development of young people.

Family Life

The connection between home life and school performance has been studied extensively over the past 25 to 30 years, and researchers have looked beyond the classroom to try to explain differences in students' academic achievement and intellectual development. One of the earliest studies on this topic (Coleman et al., 1966) finds that the socioeconomic characteristics of students' families had the most significant impact on group educational outcomes. School factors did have a modest impact, but the socioeconomic status of the family was more closely associated with educational achievement than were variations in school facilities and curriculum.

To explain these earlier findings, Coleman (1987) described how families vary widely in the resources or "capital" they possess. He distinguished between a family's "human capital" (reflected in the parents' cognitive and analytical attributes that enable them to function effectively at work and in society), and a family's "social capital" (reflected in the behavior, values, and relationships shared between parents and children that shape the development of the child). When viewed as a group, low-income families are able to invest only a fraction of the human and social capital that well-educated middle- and upper-class families invest in their children.

There is strong evidence to suggest that the nurturing provided by a family with adequate economic, social, and educational resources does contribute to the intellectual and academic development of children. For example, in various adoption studies, black children who were adopted into higher socioeconomic white families had average IQ scores far exceeding the national average for black children (Moore, 1987; Scarr & Weinberg, 1976). Thus, some have concluded that any efforts to improve achievement levels among low-income and minority groups must examine the social and economic factors that continue to block their ability to achieve (Miller, 1991b).

The kinds of intelligence and learning behaviors that our schools reward reflect the "mainstream" culture--i.e., a white, English-speaking, upper-middle and middle class version of a society that is industrial, technological, and modern (Miller, 1991a). Psychologists have illustrated that there are, in fact, many kinds of intelligent behavior (Gardner, 1983; Sternberg, 1984). However, because kinds of intelligence and learning behaviors are culturally defined and culture-specific, mismatches are possible between groups of students and schools. As James Comer argues, strategies that reduce conflict and eliminate barriers between home and school should be pursued (Comer, 1990).

Many studies exploring family influences on academic achievement have focused on racial and socioeconomic differences because black children in our society are more likely than white children to grow up in economically deprived environments. Some researchers, however, have also looked at how culture and/or behavior patterns can influence achievement regardless of race and socioeconomic status (SES).

The culture of racial and ethnic groups may vary from the classroom culture in terms of social organization, sociolinguistics, cognition, and motivation (Tharp, 1989). Studies described by Tharp (1989), Boykin (1982), Heath (1983), and Shade (1982, 1989) identify some variations in cognitive styles by racial group. Other evidence suggests that children from poor families of all races (as a group) receive fewer opportunities for learning than do children from wealthy families. According to one study, parents in higher SES families spend more time with their children than do low SES parents, allowing high SES children to have more of an opportunity to observe, converse, and participate in learning activities with an adult (Hill & Stafford, 1980). In addition, parents in higher SES families are more likely to exchange verbal information with their children and encourage them to discuss issues and ask questions (Moore, 1987; Tulkin, 1987). They are also more likely than are parents in lower SES families to interact with school personnel and take the steps necessary to advance their children's progress (Baker & Stevenson, 1986).

Racial and ethnic groups may also exhibit behaviors that are not conducive to academic success as traditionally defined in schools. Ogbu (1988) argues that in the past, blacks were excluded from opportunities open to whites with an education. As a result, many blacks were not motivated to excel academically, and they reject behaviors associated with academic achievement as being a part of white culture.

Although some researchers have concentrated on groups, others have looked closely at individuals to identify successful parenting strategies. For example, in a study of successful, low-income black students, it was found that their parents read to them, purchased books for the home, and helped them regularly with homework (Durkin, 1982, as discussed in Snow et al., 1991). In a study examining some of the factors that relate to achievement in literacy among children in low-income families, Snow et al. (1991) finds that "provision of literacy" (e.g., reading to one's children, taking them to the library, buying books etc.) and "maternal expectations for children's education" were the two most powerful predictor variables. They had positive impacts on vocabulary, reading comprehension, and writing production. The researchers also found that "time with adults" was positively associated with achievement. Children who spent more time with their parents or other adults had an advantage over those who spent more time with siblings and peers. Indicators of financial and psychological stress in the family (e.g., welfare payments, housing and unemployment subsidies, interpersonal conflicts, and living in dangerous neighborhoods) were negatively associated with achievement.

In another study of family life and school achievement, Clark (1983) offers a slightly different perspective. He believes that "It is the family members' beliefs, activities, and overall cultural style, not the family units' composition or social status, that produces the requisite mental structures for effective and desirable behaviors during classroom lessons." Specifically, he tries to show "how communication behavior in the family works to produce children's motivations, expectations, and social competence in student roles."

Based on his study of successful and unsuccessful black students from single- and two-parent families, and upper and lower socioeconomic groups, Clark identifies certain "family processes" and "functioning patterns" that appear to be linked to educational achievement. These include: (1) parental involvement in the instructional program at school; (2) the parent's psychological-emotional state (e.g., parents who feel hopeless about their own social condition do not encourage their children to master school material); (3) the presence of standards and rules for the student's home conduct (including chores and responsibilities); (4) the student's attitudes (i.e., pride/respect) toward his or her parents; (5) regular family discussions about school issues, parental involvement in social activities with the child (especially those requiring intellectual effort); and (6) the extent to which a parent is able to positively influence the child's use of time and space.

Although Clark acknowledges that poor families need support programs to help them deal with their "tremendous psychic overload," he also believes that these parents cannot expect schools and public agencies to take major responsibility for their children's academic and social success. Instead, he advocates that families should receive "practical training and information programs that pass on tools that help prepare children for specific classroom lessons." He believes that this knowledge will give parents the confidence they need to help improve their children's learning experiences.

Clearly, we are only beginning to understand the role of the family in the constellation of educative factors. Researchers have touched only lightly on the effect of families' cultural differences on student achievement. We know that families are a child's first educator, and we suspect that families primarily establish a child's educative style. But, researchers have only begun to investigate which practices are linked to successful educative styles and which are not. Research suggests that, when examined by groups, the family SES has a great deal to do with children's school success. But researchers have found it difficult to calculate the scope of resources needed to offset class differences. In addition, research illustrates that racial attitudes play an important role in school success, but, again, we have only begun to identify some ways that groups are helped or hindered by their own attitudes and those of others.

Latchkey Programs and Other Afterschool Arrangements

Self- and Sibling Care

The Census Bureau projects that by 1995 four out of five school-age children--35 million--will have mothers who are employed (Miller & Marx, 1990). The question of providing safe, high-quality child care during afterschool hours will have to be addressed by millions of families nationwide, and the choices that are made may have long-term consequences for the lives of the children involved.

It has been estimated that half of primary school children in grades K-3 are in self- or sibling care for three to five days each week (Hedin, 1986). This figure rises to about 66 percent for those in grades four through six and to 80 percent for junior high students in the seventh and eighth grades. Although 75 percent of intermediate students (fourth through sixth graders) and 85 percent of junior high students reported not minding these arrangements, only 30 percent of low-income, minority students from single-parent, urban households reported being comfortable at home without adult supervision. Furthermore, the same survey also indicated that those students who most desire afterschool programs are the ones least likely to be involved in them (Hedin, 1986). Suburban intermediate and junior high youth were three times more likely to go to afterschool programs than were urban youth. Only about 15 percent of the latter group reported participating in a program.

Although large numbers of students are not involved in formal afterschool programs or adult-supervised child care, their individual circumstances may vary widely depending on their socioeconomic status, geographic location, and family size and composition. For example, in their review of the literature, Miller and Marx (1990) report that some researchers (Entwistle, 1975; Long & Long, 1983; Woods, 1972) have found negative effects among children in urban areas, while others (Galambos & Garbarino, 1982; Vandell & Corasaniti, 1985), have found no negative impact among rural and suburban youngsters. Nevertheless, Miller and Marx (1990) identify three major areas in which self- and/or sibling care during afterschool hours may have negative effects: cognitive development, social and emotional development, and physical development and well-being.

Cognitive development. A study by Woods (1972) finds that unsupervised, low-income black girls in the fifth grade demonstrated a "marked deficiency in cognitive functioning," compared with a similar group of girls who had adult supervision. Another study of ten-year-old Canadian children reveals that unsupervised suburban boys "scored consistently lower on all adjustment and academic achievement scores" (Gold & Andres, 1978, cited in Long & Long, 1983). Miller and Marx add that although the differences in this study were not statistically significant, they were found across all social classes.

Social and emotional development. A survey of students in the fourth through eighth grades reveal that children experience many fears and concerns about being alone after school (Hedin, 1986). The feelings they expressed include boredom; concern over not finishing chores and homework; fears of getting hurt in accidents or fires, being beaten by other children, and being kidnapped, abused, or otherwise victimized; and concerns about associating with the "wrong kind of friends." The rank order and frequency of these fears varied among groups of children, depending on age, gender, and race. In general, children living in urban areas expressed more fears than children living in suburban or rural areas; younger children expressed more fears than older children; and boys and girls tended to emphasize different fears, although there were no gender differences in the number of fears expressed.

Long and Long (1981) find that black children in the first through sixth grades who spent time alone experienced "elevated levels of fear" and more frequent nightmares than did their peers who were under continuous supervision. The study did find, however, that those children who experienced fewer negative effects of being alone had very close relationships with their parents.

Although the Long and Long (1981) study has been criticized for using questionable methodologies, procedures, and controls (Robinson, Rowland, & Coleman, 1986), other studies (Hedin, 1986; Long & Long, 1983) suggest that "the perceived safety of the neighborhood may play a role in determining the impact of the latchkey experience" (Miller & Marx, 1990).

Besides fear, many children who care for themselves after school also experience isolation, loneliness, and boredom. Citing several studies (Kuchak et al., 1985; Long & Long, 1981; Zill et al., 1977), Miller and Marx explain how parental restrictions on afterschool socializing with peers leave many latchkey children with limited social relations, while the majority of adult-supervised children are able to interact with their friends with few, if any, restrictions.

Physical development and well-being. Although they acknowledge that "little direct evidence exists on this topic," Miller and Marx's review of the literature reveal that those in self- or sibling care were more susceptible to certain negative experiences. For example, a survey of close to 5,000 eighth graders (Richardson et al., 1989, as discussed in Miller & Marx, 1990) finds that those in self-care for more than ten hours per week were twice as likely to smoke cigarettes or drink alcohol and nearly twice as likely to smoke marijuana, even when the analyses controlled for factors such as gender, academic achievement, and socioeconomic status. Even students alone for only five to ten hours a week were found to be at greater risk than were their peers who received continuous adult supervision.

Children left alone or in the care of an older sibling are also subject to very real dangers. Miller and Marx (1990) discuss several studies that reveal they are often subject to physical and sexual abuse by their siblings (Finkelhor, 1979; Straus, Gelles, & Steinmetz, 1980; Zill et al., 1977), and they are more likely to be victims of accidents (Garbarino, 1980).

Miller and Marx (1990) point out that the available research studies are inconclusive about whether being on one's own from an early age primarily leads to positive long-term outcomes (e.g., self-reliance) or to more negative behaviors and attitudes. Although longitudinal studies have not been conducted, they conclude that "it's not self-care per se, but rather an interaction between being on one's own, the family context, and the neighborhood environment, which determines the developmental outcomes for children." Specifically; they identify those most at risk as being the younger children who are "living in an urban neighborhood where they must be locked inside for hours each day, and who are not in close touch with their parents."

Child Care Programs

Most of the children who attend school-age child care programs are between five and ten years old (Miller & Marx, 1990). Although most surveys of these programs have focused on descriptive information rather than on developmental impacts, Miller and Marx's review of the research literature does provide some insight into the factors influencing the various outcomes associated with different programs.

Cognitive development. Miller and Marx discuss two studies showing that children in organized child care programs outperformed those without program services. In one study (Entwistle, 1975), a group of disadvantaged children during a six-month period improved their grades in reading and arithmetic significantly more than a matched comparison group who had not received program services. In addition, the female program participants also demonstrated improved attitudes toward school, and the boys demonstrated an improved attitude toward education in general, earning improved marks in conduct. Miller and Marx point out that the program was not a remedial or tutorial program; rather, it emphasized recreational and cultural activities.

In another study (Mayesky, 1980, as discussed in Miller & Marx, 1990), program participants averaged higher mathematics and reading test scores than a matched group of peers "over several consecutive academic years and the gap between these two groups widened over time." This program did, however, include curriculum enrichment along with cultural and recreational activities. Miller and Marx caution that adult supervision alone may not be the only influencing factor. Vandell and

Corasiniti's (1985) study of middle-class, suburban third graders reveal lower test scores and grades among the children in day care vs. their peers who were alone, with a sitter, or with their mothers after school. This result lead the authors to speculate that the stigma of day care and/or the poor quality service provided at the centers influenced the findings.

Social and emotional development. Miller and Marx emphasize that the issue of program quality is central to any discussion on the impact of afterschool programs. They conclude that "good child care can enhance children's development, but poor quality child care may have detrimental effects." For example, they explain how programs associated with increased social skills, enhanced self-esteem, heightened popularity among one's peers, or other positive impacts (Entwistle, 1975; Howes et al., 1987; Mayesky, 1980) had curricula and activities reflecting a concern for the developmental needs of children. In contrast, those programs associated with negative outcomes (e.g., Vandell & Corasiniti, 1985) had program deficiencies such as an insufficient number of staff members, large group sizes, or a limited range of age-appropriate activities.

Miller and Marx (1990) also note important differences between the various types of center-based child care facilities. Using staff/child ratios, suitability of activities, level of supervision, and staff training and experience as indicators of quality, they find that nonprofit organizations were superior to for-profit chains and for-profit independent proprietors (Whitebook, Howes, & Phillips, 1989, as discussed in Miller & Marx, 1990).

Miller and Marx (1990) conclude their review by stressing the need for further research on the impact of afterschool child care programs. They point out weaknesses in the current research, which has tended to simply compare differences between adult-supervised children and unsupervised children, to determine the effect of latchkey arrangements. Such research has not contributed to increased knowledge about the link between program type and desired outcomes. In other words, more sophisticated studies are needed as "it is only by combining information on quality indicators with outcome measures, while controlling for contextual and other variables over time, that we will begin to be able to determine the effect of our efforts on child development and family functioning" (Miller & Marx, 1990).

Homework, Tutoring, and Enrichment Programs

For many students, nonschool hours represent an opportunity to relearn, "catch up," or extend their learning, and, as a result, many of their out-of-school activities bear close resemblance to those performed in school. These overtly instructional activities are generally geared toward achieving specific academic goals, although some enrichment programs may also be oriented toward developing social skills, cultural knowledge, career education, or other educational themes. In this section, we examine the extent to which three types of out-of-school instructional activities improve academic achievement, and/or influence other areas of growth and development.

Homework

The majority of school districts in the United States do not have a homework policy and, in one survey, ten State Education Departments acknowledged that "they did not have a written philosophy or position paper on homework" (Turvey; 1986). This development has led some to call for the creation of homework policies, including teacher, parent, and student input and responsibilities (Coulter, 1980; Foyle, 1986). Specifically, such a policy would: (1) help eliminate some frustrations many parents feel toward schools lacking a policy, (2) encourage teachers to give more challenging and interesting assignments, and (3) increase students' homework completion rates (Coulter, 1980).

The amount of time students spend on homework varies from an average of 2.3 hours per week for fifth and sixth graders to 5.9 hours per week for seventh and eighth graders (Patton et al., 1983, and Timmer et al., 1985, as cited in Leone & Richards, 1989). Among older students, the situation showed no improvement (U.S. Department of Education, 1991): a higher percentage of 17-year-olds (vs. 9- and 13-year-olds) reported not doing homework, and, for those who did, the amount of time spent on the task was lower for the older group.

The Education Department's report cited above (based on the National Assessment of Educational Progress [NAEP] data) also indicated that "the proportion of students who read for pleasure on a daily basis declined with age." Not surprisingly, the report found that those who read for pleasure on a daily basis had the highest reading proficiency, and those who reported never reading for fun had the lowest.

This tendency toward spending fewer and fewer hours on homework during the teen years may have a detrimental effect on a student's academic progress over time. Keith (1982) studied the impact of race, family background, intellectual ability, field of study, time spent on homework, and grades so far in high school on the grades of more than 20,000 high school seniors. He found that, next to intellectual ability, regularly completed homework was the second most significant positive influence on high school grades, and "a low ability student who did homework could achieve grades comparable to those of an average ability student who did no homework." Other researchers have noted similar relationships. In a comparative study of public and private schools, time spent on homework was one of the factors that made a difference in achievement (Coleman, 1987). Another study found that academic achievement may be influenced as much by the quality of homework time as by the quality of class time (Frederick & Walberg, 1980, as discussed in Turvey, 1986). In addition, Goldstein found that regularly assigned homework was related to higher academic achievement (Goldstein, 1960, as discussed in Turvey, 1986).

In their study of the quantity and quality of time spent on homework by 401 students in the fifth through ninth grades, Leone and Richards (1989) find that time spent on homework was positively associated with school performance. In addition, they found that: (1) time spent on homework decreased significantly with age for girls but remained constant for boys; (2) boys spent significantly less time on homework than girls; and (3) the highest achievers did not spend less time on homework as they got older.

About the quality of time, Leone and Richards find among groups no significant difference on doing homework alone, in class, or with friends. However, "adequate and overachievers were found to be significantly more likely to do homework with family members than were underachievers." Others also find evidence that family interactions can influence homework's effectiveness (McDermott, Goldman, & Varenne, 1984) and that parental involvement in homework may result in improved learning (Maertens & Johnston, 1972).

Based on their analysis of the "inner subjective experience" of students doing homework, Leone and Richards (1989) find that all students, regardless of age, reported the highest levels of "affect and arousal" when doing homework with friends and the lowest when doing their homework alone. Students were most attentive while doing homework with a parent, a development indicating that young adolescents benefit from parental structure and involvement in their homework task. The researchers also found that although doing homework was perceived to be a negative experience by all students (including high achievers), this perception was unrelated to academic performance.

Although the advantages associated with doing homework are widely extolled, not all homework assignments may be equally beneficial. In his summary of homework research in mathematics between 1960 and 1977, Austin (1979, as discussed in Turvey, 1986) finds that 16 comparisons favored students who did homework and 13 comparisons showed no difference between those who did homework and those who did not. No comparison favored the nonhomework group. Two separate studies (Knorr, 1981, as discussed in Turvey, 1986), find that: (1) homework affected achievement in arithmetic computation but had no impact on achievement in arithmetic concepts, and (2) drill and practice homework did not significantly impact reading and mathematics scores or report card grades of primary school children. Gray and Allison (1970) also find that mathematics drill homework did not improve the scores of elementary school students on fraction computation skills tests.

Such findings lead Knorr (1981) to conclude that the exact nature of the relationship between homework and academic achievement is unclear. These studies indicate that, under certain circumstances, specific types of homework assignments can lead to improvements in achievement levels while other types of assignments do not. Turvey (1986) concludes his review by calling for further research that will shed some light on the nature of this relationship by examining different kinds of homework performed under a variety of circumstances.

Limitations of the current research on homework are also discussed by Cooper (1989), who laments the absence of research in several major areas. He cites, for example, the effect of distinctions in homework assignments (e.g., the presence or absence of completion deadlines, the social context of doing individual or group projects); the impact of initial classroom factors (e.g., materials and facilities) that might influence homework's effects, particularly on poor children or slow learners; the effect of a student's physical surroundings (e.g., lighting, space, noise level); individual student characteristics (e.g., level of motivation, the possession of good study skills); and the relationship between homework and classroom instruction. In addition, Cooper points out that negative impacts such as parental pressure, instructional confusion, and physical and emotional fatigue have not been explored. He argues that these and other factors may significantly affect the link between homework and achievement and must therefore be addressed before any final conclusions can be drawn.

Nevertheless, Cooper (1989) concludes his review of the research literature with the following generalizations: (1) homework has the greatest positive impact on high school students and is progressively less effective for junior high and elementary students; (2) the effectiveness of homework is the same regardless of a student's gender or intelligence and regardless of how achievement is measured (e.g., standardized or teacher-developed test); and (3) preparation and practice homework appears to be more effective than homework restricted to current-day lesson content, particularly in junior and senior high mathematics classes.

Tutoring

Tutoring has long been thought of as an effective approach to the improvement of students' academic performance. In this section we confine our examination of tutoring to recent reports on school-based programs. The research on tutoring programs in this review involves both cross-age and peer tutoring. This section on tutoring and the next section on mentoring draw heavily from the review of the literature by Richardson (1992). Because of paucity of research, we have purposely avoided any examination of the countless private tutoring arrangements.

Cohen, Kulik, and Kulik (1982) conducted a meta-analysis of 65 evaluations of peer tutoring programs. The authors report that 45 of the 52 studies investigating achievement determined that students who were tutored performed better than those not tutored. Tutoring effects were larger in more structured programs and in programs of shorter duration. Students also made greater achievement gains when mathematics, not reading, was the subject matter being tutored and when students' achievement was measured with locally developed tests rather than nationally standardized exams. In the eight studies evaluating attitude toward subject matter, all showed that students receiving tutoring services were more positively disposed toward the subject matter than were other students.

In their review of 19 tutoring and mentoring projects in the United States, Reisner, Petry, and Armitage (1990) report that 11 projects described improvements in students' test scores, grades, and academic performance. They also cite other studies (Cohen et al., 1982; Herbst & Sontheimer, 1987; Powell, Wisenbaker, & Connor, 1987; and Valenzuela-Smith, 1983) that show similarly positive impacts on groups of low-income, and ethnic and language minority students. Studies abroad have also indicated academic and behavioral improvements (Goodlad, 1985, 1988; Schwartz, 1977, as cited in Reisner et al., 1990). Examples of effective tutoring programs fill the literature. For example:

> Lake Washington High School in Seattle sponsors a peer tutoring program providing elective class credit toward graduation for both peer tutors and tutored students. In her evaluation of this program, Cotton (1988) finds that academic achievement of both peer tutors and students improved as a result of participation in the tutoring project. In addition to academic improvement, Cotton finds that the participants also experienced improvements in self-esteem and attitudes toward school. Two program outcomes were not anticipated: (1) some tutors obtained tutoring jobs outside the program; and (2) because students developed trusting relationships with the peer tutors, they confided in each other about personal problems, and tutors referred students to services that could assist them in resolving their problems.
>
> Berea College in rural Kentucky offers two tutoring programs aimed at reducing illiteracy and school failure. One program, called Students for Appalachia, serves disadvantaged youth who have been identified as potential dropouts; this program is a highly structured tutoring program that emphasizes academic subjects. The second program, Teens United for the Future/Kids Involved in Doing Something (TUFF/KIDS), is a group mentoring project in which six college students work with 30 potential dropouts in junior and senior high school. The latter program emphasizes communication and the arts and encourages students to express themselves orally, in

writing, and through artistic media. Local survey data (as reported in Reisner et al., 1990) detected improvements in self-esteem for all participants.

Other studies have highlighted the personal, nonacademic benefits of tutoring programs. For example, as a result of tutoring or mentoring, participants are exposed to new environments and role models, enabling them to expand their vision of themselves and their future (Gregory & Berley-Mellits, 1988, as cited in Reisner et al., 1990). There is also evidence that these services help participants more willingly attack their problems while improving their self-esteem and self-confidence (Cohen et al., 1982, as discussed in Reisner et al., 1990).

Mentoring

Mentoring relationships are a traditional response to children or youth needing help or guidance. William Gray (1990) identifies three different types of mentoring. Career mentoring relationships, according to Gray, usually last up to five years and focus on the career advancement of proteges within a particular business or organization. These relationships differ from apprenticeships, which have historically involved a strong mentoring element; because of the informality of career mentoring, the protege may be unaware of the mentoring relationship in its early phases. Second, informal life mentoring relationships begin when a more experienced person identifies someone younger with promise or potential and then acts for that protege as a teacher, guide, and counselor. The third type of mentoring, called planned project mentoring, is gaining popularity in school districts as a way to address the individual academic and psychosocial needs of students at risk of educational failure. In a planned project, mentoring relationships generally last four to 18 months, focusing on helping students stay in school to obtain a high school diploma while also exploring career possibilities.

A good example of this kind of planned project is a collaborative effort between the City University of New York (CUNY) and the New York City Board of Education (BOE). Mentors in the program are drawn from students enrolled in any of the 12 participating CUNY colleges and trained and assigned to New York City high school students. Mentors meet with their students twice weekly in sessions that include social and recreational as well as academic activities. The mentoring sessions themselves are highly structured and organized around a career exploration curriculum developed for this purpose (as reported in Reisner et al., 1990).

According to an evaluation by Gregory and Berley-Mellits (1988), 73 percent of the student participants reported that they received help with their schoolwork, 80 percent reported that they had learned about and experienced college life, and 81 percent said they had engaged in career exploration activities. In an earlier evaluation, Turkel and Abramson (1986) reported that participating high school students indicated a more positive attitude toward school upon completion of the program, compared with their attitudes at the beginning of the program. The mentors also rated the abilities and attitudes of the students as higher and more positive at the end of the program than at the beginning. Students' reading scores, grade averages, and attendance levels improved slightly during the program, although none of these results was statistically significant.

Although most programs report varying degrees of success, certain important characteristics have been identified as contributing to a tutoring or mentoring program's effectiveness (Reisner et al., 1990). In successful programs there were: (1) clearly defined expectations and time commitments between students and tutors/mentors, (2) a screening process to ensure the quality of tutors and mentors, (3) efforts to ensure that tutors and students were well suited to each other, (4) some form of training or preparation for tutors or mentors, and (5) ongoing monitoring and evaluation of the program. Reisner, Petry, and Armitage (1990) also found that highly structured projects tended to experience more success than did other programs.

A review of the research literature reveals a high degree of consensus among researchers. Most have found that both tutoring and mentoring have had a positive impact on students' achievement, motivation, attitudes towards education, self-esteem, and self-confidence. However, successful tutoring or mentoring programs are not casually planned or implemented and require structured screening, training, and evaluating.

Enrichment Programs

Enrichment opportunities take place in museums, libraries, community centers, music studios, theaters, churches, and private homes. Unfortunately, we are only beginning to understand the effect of the variety of educative influences beyond formal schooling on individuals. In part because it is difficult to measure the effect of the great variety of enrichment opportunities, this section focuses on one narrow aspect of enrichment--career and academic achievement programs for targeted groups. There are many schools, colleges, universities, and businesses offering special programs designed to improve the career opportunities and achievement levels of particular groups. Generally, services are available to students after school, on weekends, and/or during vacation periods. These programs target special groups of students such as minority, low-income, gifted, or at-risk students (Wilbur, Lambert, & Young, 1988).

This section briefly describes some programs that serve students directly and, where possible, their impact on participants. In each case, one or two specific examples will be described. Unfortunately, in many instances formal evaluations have not been completed, and it is difficult to generalize about the impact of these programs because they differ in services offered, groups served, and overall goals. In addition, most programs do not provide information that is relevant or important to assessing their impact. For example, they do not describe how participants are chosen or recruited, nor do they report on the graduation rates of participants or present longitudinal data on college and career achievements. Nevertheless, advocates of these programs believe that the outcomes of these relationships are positive because they contribute to "enhanced learning opportunities, motivated students, rejuvenated faculty, and rising morale" (Scott D. Thomson, Executive Director, NASSP, quoted in Wilbur et al., 1988). Enrichment programs often target low-income students and seek to develop cooperative relationships between colleges and universities and high schools. The following are representative examples:

> School, College, and University Partnerships Program. This federally funded program seeks "to encourage partnerships between institutions of higher education and secondary schools serving low-income students" (ED, 1989). The program supports efforts to improve the academic ability, and prospects for employment of students. It includes enrichment activities, tutoring, and teacher training. Approximately 6,500 students received services in FY 1989. There are currently no planned studies to assess its impact.
>
> Upward Bound. This program is sponsored by institutions of higher education and public and private nonprofit agencies. Its goal is to increase the academic performance of low-income and "potential first-generation college students" and encourage them to attend, and be successful in, a postsecondary education program (ED, 1989). Services are offered to 13- to 19-year-old students and include instruction in reading, writing, study skills, mathematics, and other subjects; academic, financial, and personal counseling; and exposure to cultural events, a wide range of career options, and tutorial services. The most recent study of the program was performed in 1984 by the Applied Systems Institute (ED, 1989). Their findings were as follows:
>
> - Disadvantaged youth in Upward Bound were more likely than comparable nonparticipants to apply to college, obtain financial aid, attend college, and persist in college for one year after high school
>
> - Upward Bound students earned more college credits than their peers during the first three semesters of college
>
> - The retention rates for Upward Bound students in college were not significantly greater than their peers 21 months after high school
>
> Talent Search. Serving a similar population, this program shares similar goals with Upward Bound. Students may be between the ages of 12 and 27, and assistance with the re-entry

> process to high school or college is provided. In addition, some projects focus on seventh and eighth graders and include components such as parental involvement, mentoring, study skills improvement, peer and group counseling, and advising on high school course selection.
>
> A 1985 study of the program by the College Entrance Examination Board concluded that it was difficult to evaluate program effectiveness because individual projects collected and reported data in very different ways (ED, 1989).

Other types of programs attempt to challenge high achieving students (often low-income students) by exposing them to a college atmosphere. In some cases, they offer high school students an opportunity to earn college credit. The following is one example of such a program:

> The Gifted Math Program. This program offers college-level instruction to precollege students (Wilbur et al., 1988). The State University of New York-Buffalo, in cooperation with area schools, offers gifted and highly motivated mathematics students (top 1 percent) the opportunity to participate in this six-year program. Students enter the program in the seventh grade and study math at the University after school for two evenings each week. Those who complete the program may earn up to 22 semesters of college credit if grades of A or B are earned.

Programs focusing on minority, disadvantaged, and at-risk students often "address thinking, problem-solving, and study skills; provide better counseling, remedial assistance, and realistic job experiences to improve attitudes about work" and often "employ a variety of rewards and incentives to encourage students to elect and successfully complete the necessary academic subjects that will allow them to pursue the widest range of career options" (Wilbur et al., 1988). There are a large number of these programs in colleges and universities around the country, and many share similar characteristics with the programs outlined below.

> The Mathematics, Engineering, Science Achievement Program (MESA). MESA's goal is to improve minority achievement in mathematics and science and encourage minority students to major in these areas at college. Services include tutoring, independent study groups, academic and university advising, field trips to job sites where technical professionals are employed, summer enrichment and employment programs, and scholarship incentive awards for those who maintain a B+ average in advanced-level mathematics, science, and English classes. Ninety percent of the program's graduates have gone on to study at a college or university, and more than 66 percent of these have majored in related technical fields (Wilbur et al., 1988).
>
> Creating Higher Aspirations and Motivations Program (CHAMP). CHAMP seeks to encourage minority ninth- through twelfth-grade students to stay in school, take more challenging courses, and develop attitudes that will contribute to their success in postsecondary institutions. The core of the CHAMP program is its two-day winter workshops and six-week summer sessions that emphasize thinking and problem-solving techniques and

> offer classes such as algebra, trigonometry, English, and computers. CHAMP is sponsored by the University of Wisconsin; the commitment and support of the university, school district administration, minority community organizations, and parents are credited with contributing to the program's success.

Many businesses have also established partnerships with schools, creating a variety of afterschool programs that provide educational services and/or employment opportunities for school-age children. Below are examples of programs cited by Levine and Trachtman (1988) in their review of corporate involvement in public education. Although a few of these programs do operate during the typical school day, they invariably take place outside of the school building. As is the case with school-college partnerships, most of these efforts have not been formally evaluated:

> Metropolitan Life Insurance. As a participant in the New York City Partnership's Summer Jobs Program, MET has provided thousands of students with their first work experience, career education, and encouragement to continue in school. Volunteering to work as mentors, MET employees are paired with students. For two hours each week the students visit their mentor's worksite and are exposed to the social and professional skills required for success in the workplace. Active and retired employees are also involved in a tutoring program.
>
> Burger King Corporation. Through its special scholarship incentive program, Burger King offers its employees an opportunity to earn bonus credits worth up to $2,000 to be used for postsecondary education. Credits are based on length of service and the maintenance of at least a "C" average in school. A second scholarship program is also available to those with a minimum "B" average. The company has provided financial support for the Cities in Schools program, which coordinates public and private support services for at-risk youth. Much of the counseling takes place outside of the school setting. The success of this program has been well documented: attendance rates for juvenile offenders and truants who participated in Houston fell from 88 to 57 percent, and in Atlanta, "where half of the Cities in Schools' students had been dropouts prior to program enrollment, attendance rates went up to 82 percent."

The businesses in these case studies were companies "that see sustained successful involvement with education as growing out of the corporation's central goals and purposes." Thus, although students may experience an "awakening of a sense of opportunity," increased self-esteem and an incentive to stay in school as a result of these efforts (Levine & Trachtman, 1988), companies can also contribute to educating the kind of employees they need most--those who are skilled, educated, and motivated.

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Clubs and Youth Organizations

There are 400 national organizations specifically serving young people listed in the *Directory of American Youth Organizations*; an additional 17,000 other nonprofit organizations classify themselves as youth development organizations. Seven out of 10 eighth graders report that they participate in outside-of-school activities (Pittman, 1991). Students express various reasons for becoming involved in these out-of-school organizations, among them to: derive a sense of belonging and accomplishment; meet new friends; participate in a range of new activities without fear of failure; escape the competitiveness of school activities; and find new challenges (Hedin & Simon, 1980).

Although those active in groups such as 4-H clubs identify such benefits as gaining new skills, meeting new friends, and developing leadership skills and self-confidence, large numbers of teenagers also report that participating in these organizations takes time away from extracurricular school activities such as playing sports, working part-time jobs, "hanging out" with their peers, and spending time with their families (Hedin & Simon, 1980). In addition, many teenagers were reluctant to put themselves under more adult supervision and assume new duties and responsibilities during their free time.

Especially at the high school level, youth clubs and organizations compete with extracurricular school activities for students' time. School-based activities are usually more accessible and offer more prestige, status, and recognition among students (Hedin & Simon, 1980). Nevertheless, millions of youngsters, including those who are disadvantaged, are attracted by what these groups have to offer. It has been estimated that the Boy and Girl Scouts, 4-H, YWCA, YMCA, and Boys and Girls Clubs of America reach 30 million children and youth annually (Pittman, 1991). Besides these national organizations, a large number of smaller, local organizations reach out to youth with similar services and activities.

Based on her review of major youth-serving organizations, Pittman (1991) identifies and summarizes the main goals of these organizations by the "competencies" they promote and develop and by the particular needs they try to fulfill in the lives of young people. This "working list of desired assets for youth" defines and describes the behaviors and skills that "are needed for adult success." There is widespread agreement among the major youth-serving organizations that these particular areas are important to overall youth development.

The five areas described by Pittman (1991) are: (1) health and physical competence (e.g., "knowledge, attitudes and behaviors that will ensure future health"; (2) personal and social competence (e.g., the development of intrapersonal skills, interpersonal skills, coping skills, and judgment skills); (3) cognitive and creative competence (e.g., appreciation of and participation in areas of creative expression, such as oral and written language skills); (4) vocational competence (e.g., awareness of vocational options); and (5) citizenship competence (e.g., ethics and community participation). In addition to these competencies, Pittman (1991) also identifies certain personal needs young people have that youth-serving organizations seek to meet, among them a sense of safety and structure, belonging and membership, self-worth, independence and control over one's own life, closeness with others, and competence and mastery.

Several factors enable youth-serving organizations to meet these needs and foster these important competencies (Pittman, 1991). One factor is size and structure. The majority of nonprofit, youth development organizations are small in size and budget, giving them the flexibility to "change the content and structure of programming and supports much faster than do schools." Pittman suggests these smaller, community-based youth organizations may therefore be more responsive to the changing needs of a community because the larger, national organizations have guidelines, mission statements, and programming standards and traditions that hinder their ability to make major changes within a short period.

In her review, Pittman notes, however, that although the national youth organizations and the smaller, nonaffiliated community youth groups differed in the type of programs offered, they both "utilized practices and strategies in service delivery that addressed the basic needs of adolescents." Specifically, Pittman highlights: (1) using small groups, symbols of membership, and regular meetings, which all help to meet adolescents' need for a sense of structure and belonging; (2) encouraging youngsters to express their ideas and choose from among activities, which contributes to adolescents' decisionmaking abilities and a sense of self-control; and (3) creating manageable challenges that give youngsters a chance to make visible progress, obtain rewards, and develop a sense of achievement.

There is much variety in the programs offered by national and community-based youth clubs and organizations. Most organizations offer one or more of the following: health education; preventive services (alcohol, drugs, and pregnancy); remedial education and dropout prevention; job training; crisis intervention and counseling; community service; sports; and the opportunity to develop new interests and practice new skills (based on the nature of the organization--e.g., civic, religious, outdoor/adventure, etc.). The importance of these services, according to Pittman (1991), is especially marked in low-income neighborhoods where both young people and their parents place a high value on "low-cost, safe and interesting activities to engage in during nonschool periods."

Much of the data on the impact of youth clubs and organizations are qualitative rather than quantitative, and even some of the larger organizations such as the Boy and Girl Scouts and the YM/YWCA have not conducted formal evaluative studies to measure the impact of their programs. Anticipated outcomes are often difficult to measure, and many participants receive a variety of services, thus making it more difficult to identify specific independent variables. The underlying assumption appears to be, however, that these programs are beneficial, so efforts are geared toward improving and expanding service delivery rather than program evaluation.

A few studies and surveys cited by Pittman (1991) do indicate some empirical evidence of program benefits. None of the studies, however, can show causal connection between program (or activity) and positive outcomes for individuals.

Surveys of both alumni and current members of youth clubs and organizations reveal that most believe their involvement helped them to achieve a sense of pride in their accomplishments, self-confidence, an ability to work with others, improved leadership abilities, improved employment and communication skills, an opportunity to learn new things, and general success in adult life (Ladewig & Thomas, 1987; Louis Harris surveys of Boys' Club of America alumni, 1986). Another study of former members of youth-serving organizations reveals that members had attained higher levels of education, were more likely to be involved in civic activities and political organizations, were more likely to be employed, and reported higher incomes than their peers who had not participated (Ladewig & Thomas, n.d, as cited in Pittman, 1991). Pittman (1991) also reports on an evaluation of the Teen Outreach Program (a life-skills management and community service program for high school and middle-grade students), which found that over a four-year period, participants averaged "a 16 percent lower rate of school suspension, a 36 percent lower rate of school drop out, and a 42 percent lower rate of pregnancy than students in the control group."

Additional evidence suggests that youth organizations may influence not only individual lives but communities as a whole. An evaluation of the impact of Smart Moves--a program to reduce substance abuse in public housing projects sponsored by the Boys' and Girls' Clubs--has shown promising results (Schinke, Cole, & Orlandi, 1991). Public housing sites with a Boys' and Girls' Club had "13 percent less juvenile crime, 22 percent less drug activity, and 25 percent less crack presence than public housing without Boys' and Girls' Clubs." Furthermore, although the evaluators did acknowledge certain weaknesses in their research design, an analysis of school data suggests "lower percentages of school academic failure, repeated grades, and behavior problems in schools serving public housing sites that have Clubs." The evaluators credited the Clubs with stimulating increased parental involvement and adult supervision of youth and facilitating better communication among residents, the police, the housing authority management, and other community groups.

Success has also been demonstrated in a special program that targets at-risk youth (Boys and Girls Clubs of America, n.d). Using a referral network of linkages with schools, courts, the police, and other community agencies, the Clubs recruit youngsters into core program activities emphasizing personal, educational, citizenship, and leadership development; cultural enrichment; health, physical, outdoor, and environmental education; and social recreation. Of the more than 10,000 youth that have been recruited so far, "39 percent have demonstrated a positive change in academic performance," and "93 percent did not become re-involved with the juvenile justice system after joining the Club."

After examining a wide range of groups and organizations, Pittman (1991) concludes that national and community youth-serving organizations do appear to be meeting important adolescent needs. They are particularly important for disadvantaged students who, because of few social outlets and opportunities for intellectual growth, are unlikely to adequately gain these competencies or have their needs fulfilled. In economically disadvantaged neighborhoods, these organizations may provide the only "shelter" against the negative influences that hinder personal growth and development (Littel & Wynn, 1989; Steinberg, 1988, as cited in Pittman, 1991).

Given that youth development, whether positive or negative, is an inevitable process, Pittman (1991) emphasizes the need for further research that will "juxtapose current conceptualizations of what adolescents experience, do, and need, with what families, communities and society expect, reject, and offer." This research will more accurately identify agents and strategies creating stumbling blocks for adolescents and those most effectively promoting positive youth development.

Sports and Other School-related Extracurricular Activities

School districts offer, support, and house many activities. Participation is virtually a requirement for students aspiring to selective colleges. Although it is commonly believed that sports and extracurricular activities contribute to the development of individuals, some activities (certainly varsity sports) are selective and can accommodate only a limited number of students. In addition, categorizing these activities as "extra," makes them vulnerable to budget cutting in difficult financial times. Besides questions of accessibility of sports and extracurricular activities to the majority of students, most research has centered around the issue of the relationship between extracurricular activities (especially sports) and academic achievement.

Sports

The impact of sports on academic achievement has been debated for years. Research studies continue to produce inconclusive, if not conflicting, reports. Some indicate lower academic performances among school athletes (e.g., Landers & Landers, 1978), and others report an association between athletic participation and higher GPAs, an enhanced self-esteem, and higher educational aspirations (e.g., Rehberg & Schafer, 1967). A more recent study of 1,500 student athletes and 4,553 nonathletes by Soltz (1986) finds that, on average, athletes' grades were consistently higher than those of nonathletes. Furthermore, "significantly fewer athletes received a failing grade during competition than when they are not actively competing."

That athletes might enroll in fewer and less challenging classes during the competitive season may explain these findings--or, faced with less time, student athletes learn to study more efficiently (Soltz, 1986). Research limitations make it impossible to correctly interpret the finding.

One factor complicating efforts to assess the overall impact of sports has been the evidence of differential impacts among groups of students depending on their gender, socioeconomic status, and/or geographic location. A study released by the Women's Sports Foundation (Newman, 1989) finds a link to improved academic performance in only 3 of the 18 groups studied: rural Hispanic females, suburban black males, and rural white males. The study of 13,000 student-athletes took place over a six-year period and was based on data from ED's longitudinal study of high school students entitled High School and Beyond.

The researchers find that athletes did outperform their peers. However, they argue that other variables, such as socioeconomic status, influenced these results. They conclude that "participation in high school athletics can encourage some minority and female students to stay in school and give them an appetite for leadership, but it has little effect on their academic achievement or success in later life" (Newman, 1989, p 13). In fact, among one group---black urban females---sports participation was associated with lower status jobs after high school and lower job expectations. The results were also affected by geographic variables. For example, in rural and suburban areas student athletes were less likely to drop out of school, but sports participation had no impact on the dropout rates of those living in urban areas.

The controversy surrounding athletics and achievement extends to studies that have attempted to assess the impact of participation on a single group--in this case, black males. It has been argued that unrealistic athletic aspirations among young black males leads them to neglect academics and other work-related skills development. As a result, they are ill-prepared to "make it" in the labor market after high school or even college (Edwards, 1983, as discussed in Anderson, 1990). In summarizing Edwards' findings, Anderson reports that the majority of black athletes "have no postcollege, career occupational plans" and "they are unemployed more often, and earn less when they do have jobs, than their nonathletic peers." In addition, they switch jobs more frequently and are generally less satisfied with their jobs.

One study of black males at an academically selective high school finds no evidence that black student athletes were being hurt by their involvement in sports (Anderson, 1990). They had similar GPAs and spent approximately the same amount of time on homework (even though they spent three times as much time playing sports) as their nonathlete peers.

In a study of the long-term educational and employment careers of college varsity athletes from the high school class of 1972, Adelman (1990) reports mixed findings. Although varsity football and basketball players entered college with lower high school grades and test scores than their peers, they graduated at only a slightly lower rate. However, they took a longer time to graduate, took less demanding courses, and earned lower grades than nonathletes. Adelman also finds that participating in varsity sports at the college level was positively correlated with economic mobility: at the age of 32, ex-varsity football players and basketball players had the highest rate of home ownership and lowest rate of unemployment of all the groups studied. Unfortunately, compared with their peers, the occupations they were involved in were, according to Adelman, more likely to be below the status level they had aspired to at age 19 and were "less likely to offer long-term mobility."

Rather than focusing exclusively on the nature of the relationship between achievement and athletics, some researchers have tried to demonstrate how teachers and other adults can encourage students to achieve through their athletic experiences. For example, a program in the Lynchburg, Virginia, Public Schools (Jones, 1986) mandated a 50-minute study hall, three times each week, for student athletes who had received below a 2.0 GPA the previous semester. Teachers volunteered to provide tutorial assistance and help ensure that the atmosphere in the study hall was conducive to doing homework and quiet studying. As a result, more than 62 percent of the student-athletes in the study hall had a higher GPA than they had in the previous semester, 50 percent of them earned their highest GPA ever, and more than 30 percent earned a 2.0 GPA. (Results for freshmen athletes were less impressive, with only 10 percent of them earning a 2.0, compared with 40 percent of upperclassmen). Jones (1986) believes that such programs emphasize "that academics and athletics go hand in hand."

Wandzilak and Potter (1986) explore how students can also learn values through their athletic experience if coaches are willing to spend time developing areas not directly related to success in their sport. The researchers emphasize that, contrary to popular perception, athletes do not automatically learn values through playing sports; values must be taught through specific effort. They outline "four major steps [that] can be taken to make values development through physical activity a more attainable goal." First, the coach has the potential to serve as an influential role model. He or she can set standards, reinforce or reward appropriate behavior, and encourage youngsters to emulate positive examples. A second step is for coach and players to identify and define specific values such as honesty, decision making, playing fair, and hard work. The third step entails designing learning experiences around these values. For example, a coach can lead a discussion on the qualities that a good team captain should possess and then allow students to chose one, or team members can discuss the most appropriate way to deal with an opponent who cheats. The final step in teaching values is evaluation, which can be accomplished by observing and recording instances of appropriate and inappropriate behavior, or by using "instruments of moral reasoning" (Colby & Kohlberg, 1983; Rest, 1979, as cited in Wandzilak & Potter, 1986), or by sportsmanship questionnaires (Allison, 1981; Lakie, 1964, as cited in Wandzilak & Potter, 1986).

School-related Extracurricular Activities

American youth participate in a variety of extracurricular activities at school. *The Gallup Study on America's Youth 1977-1988* reports that in 1985, 32 percent of teens surveyed played interscholastic team sports, 20 percent played intramural sports, 7 percent were cheerleaders, 11 percent were involved in drama, 9 percent worked on the yearbook, 7 percent on the school newspaper, and 3 percent were members of the debating team. Large numbers were also involved in many types of vocal and instrumental music groups (Bezilla, 1989).

Many surveys and studies have indicated an association between extracurricular activities in general and various positive outcomes and behaviors. For example, the Gallup Survey shows that above-average students participated at higher than average rates in all extracurricular activities, and high school social participation has been positively correlated with high school and posthigh school educational achievement, as well as occupational status five years after graduation (Snyder, 1969). Other reported benefits include increased cross-race contact (Scott & Damico, 1984), fewer at-risk behaviors (Benson, 1990), and later participation in voluntary organizations (Hanks & Eckland, 1978; Otto, 1975; Spady, 1971, as cited in Pittman, 1991).

In her study on reading skills development, Siegel (1989) examines the experiences and behaviors of children at three intervals: preschool, elementary, and secondary. She then identifies the patterns of mean reading scores produced by these experiences and related them to the reading achievement of 2,177 high school seniors. The results indicated that the greater the level of students' involvement in activities such as part-time jobs, watching television, and socializing with friends, the lower their overall reading achievement. On the other hand, the higher students' level of involvement in organized extracurricular activities such as academic clubs, sports, student government, band, and/or special lessons, the higher their reading achievement. Siegal also notes that the effect of these "achievement-related experiences" was stronger among those from lower socioeconomic backgrounds, although all social class and gender subgroups benefitted.

This last finding had also been noted by Snyder (1969), who finds that "social participation in high school activities generally shows the stronger relationship with educational achievement for the children of blue collar workers." Steinberg's (1988) review of the more recent literature on extracurricular activities also leads him to conclude that its effects are "conditional"--varying according to students' race, socioeconomic background, and the nature of the particular extracurricular activity.

Several earlier studies (Coleman, 1961; Hauser & Lueptow, 1978; Schumaker, Small & Wood, 1986; and Stevenson, 1975, as cited in Steinberg, 1988) found more inconsistent results. Steinberg points out a common weakness of these studies: most focus on only one subgroup (male students) and one extracurricular activity (athletic participation). Steinberg (1988) also observes that the current research is too scant and limited in scope to adequately explain why "those with less promising backgrounds" seem to reap more academic benefits from participating in extracurricular activities. One possible explanation he offers is that the individualized attention that a teacher or coach gives during these activities (e.g., closer monitoring of progress, supervision, personal interest) provides the extra encouragement crucial for academic success.

A relationship between early adult political activity and extracurricular activity has also been demonstrated (Hanks, 1981). In this study, Hanks investigates whether "youthful involvement in organizations contributes to the process of socialization to citizenship." He separates voluntary associations into two groups: "instrumental" and "expressive." The former included the school newspaper, yearbook, subject matter clubs, political clubs, and vocational educational clubs. The latter included groups such as hobby clubs, athletic groups, cheerleaders, band, and chorus; these groups were characterized as associations that "serve as ends in themselves."

Using longitudinal data from a national sample of adolescents who were followed up two years after being initially surveyed as high school seniors, Hanks finds that participating in voluntary associations, especially "instrumental" ones, is related to adult political activity, independent of social class, ability, academic performance, and self-esteem. More specifically, he finds that this impact was strongest in the area of campaign participation and "discussion of the issues" while affecting voting rates somewhat less. Although he believes that this apparent relationship is a result of voluntary associations providing members "with attitudes, incentives, information, and other personal skills and resources necessary for political action," Hanks acknowledges that some uncontrolled-for antecedent factor could have influenced the results. He recommends that more detailed research be completed to determine whether this is in fact the case.

Much more needs to be known about extracurricular activities and student development. We find little to illuminate the various effects of specific extracurricular activities on different groups of students. In addition, we can find no research on the effect of a vigorous extracurricular program on the school culture, the teachers, and the administrators.

Community Service

The longstanding idea of community service as part of a student's education has risen and fallen on the education agenda. Since the mid-1980s, community service as part of school reform has gained a good deal of attention. Boyer's *High School* (1983) calls for 120 hours of community service as a requirement for graduation. Goodlad's *A Place Called School* (1984) includes community service among his suggestions for school improvement. Harrison (1987) further develops the community service idea in a Carnegie special report, as does the W.T. Grant Foundation's report, *The Forgotten Half* (1988). This section examines some of the most recent research on community service and youth service programs.

For many young people, part-time employment and community service are major competitors in both time and values (Lewis, 1988). The participation rate of students in school-based community service is low: 50 or fewer students per high school are involved in two-thirds of all programs, and students serve less than two hours per week in more than half of the programs. In the mid-1980s, only 27 percent of all high schools offered community service opportunities, with approximately 900,000 high school students involved (Newmann & Rutter, 1986).

Although the total number of students participating in community service is low, participation rates do vary across schools (Newmann & Rutter, 1986). For example, nonpublic schools, schools with large numbers of students, and schools located in suburban areas are the most likely to offer service opportunities. In addition, alternative public schools and Catholic schools tend to offer more service opportunities and are also more likely to give academic credit for serving, or to require service for graduation.

Various legislative efforts during the 1980s were designed to encourage the expansion of school-based service programs. According to a 1986 survey conducted by the Council of Chief State School Officers and the National Association of State Boards of Education, ten states had developed policies or guidelines on school-based community service programs while another seven were developing similar plans (Conrad & Hedin, 1989). This new interest was influenced by findings showing how young participants benefitted from these service programs. Among the benefits often cited were: a new ability and willingness to cooperate and assume responsibility, improved problem-solving skills, and enhanced self-esteem (Lewis, 1988).

Although advocates of youth service agree on its benefits, they sometimes view its primary purposes quite differently (Conrad & Hedin, 1989). Some emphasize its role as a tool to reform young people involved in socially unacceptable behavior such as crime and drug use, and others believe that it should be integrated into the academic curriculum, thereby promoting students' social and intellectual development. According to Conrad and Hedin (1989), this latter group of "education reformers" view youth service as a component of experiential education. In keeping with the theories of Dewey and Piaget, they believe youth service should allow students to put into practice what they have studied, thereby enhancing learning and understanding.

In summarizing the outcomes associated with community service, Conrad and Hedin (1989) note that very little is "proven" by the research. They explain that community service is not easily defined, participants may be involved in a variety of different activities, or participants' experiences may have been brief or frequently interrupted. In addition, the outcomes being measured are "very complex, subject to many interacting influences" and are therefore "not likely to be accurately measured through conventional paper and pencil questionnaires."

Despite these limitations, Conrad and Hedin (1989) identify several academic, social, and psychological benefits suggested by some quantitative studies and by anecdotal accounts of service programs. Positive outcomes identified include: (1) gains in social and personal responsibility among students who were 4-H members (Hamilton & Fenzel, 1988), and among those participating in community service, career internships, and outdoor adventure (Conrad & Hedin, 1982); (2) more favorable attitudes toward adults and others within organizations (Conrad & Hedin, 1982); (3) a greater sense of efficacy and higher self-esteem (Luchs, 1981); (4) lower levels of alienation and isolation, and fewer disciplinary problems among junior high school youth (Calabrese & Schumer, 1986); (5) an improved sense of social competence (e.g., communicating with groups or starting conversations with strangers [Newmann & Rutter, 1983]); (6) increases in reading and mathematics achievement scores among those who engage in peer tutoring (Hedin, 1987); (7) a reduction in drug use among those participating in drug prevention programs that used peer counseling (Tobler, 1986);

and (8) gains in factual knowledge and skills directly related to their experiences in community service (e.g., counseling and problem-solving abilities [Conrad & Hedin, 1982; Hamilton & Zeldin, 1987; Sprinthall & Sprinthall, 1977]).

In addition to the quantitative studies, Conrad and Hedin (1989) also find qualitative evidence indicating the value of community service. They note that although such evidence is usually not regarded as highly as quantitative analysis, "the fact that participants are willingly and consistently acting in a socially responsible manner (e.g., volunteering in a nursing home or petitioning city hall to crack down on polluters) is at least as relevant to the issue as how they mark a test of attitudes about being socially responsible." The researchers also emphasize the importance of personal feelings. In response to the results of a survey of 4,000 students in which 75 percent reported having learned "more" or "much more" in their service activities than in their regular classes, Conrad and Hedin (1989) suggest that "when people feel strongly that they have learned a great deal, they probably have done so."

Evidence such as this has encouraged efforts to increase service opportunities for students, especially through the schools. Some of the more popular strategies for achieving this goal include integrating youth service into the curriculum, mandating service "credits" for graduation, emphasizing service in certain magnet school programs, and developing new service opportunities within communities (Lewis, 1988). Such efforts are facilitated by the many opportunities available to students who wish to serve. Estimates provided by the Urban Institute and the American Institutes for Research in 1988 show room for 500,000 volunteers in education- and school-related services; 275,000 in serving the severely restricted elderly and handicapped; 225,000 in environmental protection and urban/rural conservation; and 200,000 in criminal justice, corrections, and public safety (cited in Florida Department of Education, 1990).

The performance of community service, however, does not guarantee desired outcomes in the absence of certain program features or careful program planning. For example, Newmann and Rutter (1986), in discussing the findings of their earlier study of eight exemplary community service programs (1983), emphasize the need for service opportunities to be related to the specific goals being sought. They suggest, for example, that if a program seeks to develop civic responsibility, participants should be placed in a setting where their services respond to a critical social need, such as serving in a soup kitchen. In contrast, a student seeking career opportunity exposure would not necessarily benefit from such a placement.

Besides linking service duties and responsibilities to desired goals and outcomes, Newmann and Rutter (1986) stress the importance of a reflective seminar that allows students to share and discuss specific issues and experiences, thereby reinforcing what has been learned as a result of service placement. The value of "combining action and discussion" is also noted by Conrad and Hedin (1989) who, after examining several program variables such as length, intensity, and type of community action, find that "the presence of a reflective seminar was the one program feature that made a clear difference on social and intellectual dimensions of development." In other words, learning from service does not "just happen." Rather, it occurs through conscious effort and purpose.

Only an estimated 7 percent of all high school students were involved in community service in 1984, and those involved in curriculum-related programs represented less than 3 percent of the total enrollment (Newmann & Rutter, 1986). Many community service advocates would like to see far more integration of community service into the school curriculum (Conrad & Hedin, 1989; Florida Department of Education, 1990), where it would be available to larger numbers of students, and specific learning outcomes could be actively targeted and promoted.

The special potential of "service-learning" (as this curriculum integration effort is called) to influence achievement and development among at-risk students has also been noted (Florida Department of Education, 1990):

> When Service-Learning becomes an integral part of coursework, students connect academics with creating a better world, making a difference in someone's life, learning about caring and being cared for, and feeling good about themselves. Many students realize they like and can handle mathematics and English and science when it is applied to real settings. Their self-confidence to succeed in previously troublesome classes increases and their enthusiasm for school is renewed.

Other ways in which community service reduces and prevents self-destructive behaviors among at-risk youngsters are by: (1) promoting positive, nurturing connections between students and their families, schools, and communities; (2) promoting important societal values such as respect, trust, and toleration; (3) providing exposure to positive adult role models and facilitating the assumption of adult responsibilities and social skills; (4) enabling students to acquire and apply intellectual skills through "experiential hands-on" activities--the way many at-risk youth may learn best; (5) introducing them to individuals from a wide range of racial, socioeconomic, and ethnic backgrounds; (6) promoting both activities that encourage expression, such as art, and those that encourage constructive risk, such as theater, dance, and music; and (7) providing an opportunity to help and receive help from their peers (Florida Department of Education, 1990).

Although its benefits are well known and documented, many school districts face barriers to implementing community service programs. These barriers include cost, scheduling and transportation difficulties, problems in locating a suitable and adequate number of placements, a shortage of teachers trained in the service-learning approach to education, and uncertainties about educational outcomes (Rutter & Newmann, 1986; Conrad & Hedin, 1989). In addition, many students and parents object to making community service mandatory. Advocates have thus far been unable to overcome many of these barriers and objections. As a result, community service is offered mostly as a volunteer club activity, with only a handful of schools offering high school credit for service and fewer still requiring service for graduation (Rutter & Newmann, 1986). According to Conrad and Hedin, "service as a club activity tends to attract a narrow spectrum of more affluent students and may perpetuate the stereotype of volunteerism as an elite activity."

Part-time Employment and Apprenticeships

The extensive literature in this area will be more thoroughly explored by a parallel Studies of Education Reform examination of school-to-work transition initiatives. Here we acknowledge the fact that, for many adolescents, work significantly consumes their nonschool time. Most teenagers work at low-skill, minimum wage jobs to earn money that they spend on clothes, transportation, and entertainment. Other students work because they must contribute to total family income or must support their own basic needs for food and shelter. For many, the portion of their day when they are earning money makes more sense than the portion when they are learning. Acknowledging and building on the desire of many high school students to make the relationship between education and work more explicit, there is escalating interest in an American version of the apprenticeship system that is a pillar of some European educational and training systems. In this section, we briefly examine the educative value of work and hands-on experience as significant variables in adolescents' out-of-school uses of time.

Part-time Employment

During the 1970s, various governmental and academic organizations promoted programs to encourage students to seek part-time employment. These efforts were fueled by a belief that young people would benefit by combining their education with work experiences (Bachman & Schulenberg, 1991). The success of these efforts is reflected in the fact that, currently, more than 80 percent of students have school-year employment experience before graduation (Steinberg et al., 1988).

In recent years, however, many researchers have identified negative outcomes from teenage employment, including drug and alcohol use, poor school performance, unsatisfactory relationships with peers and parents, and cynical attitudes regarding business ethics (e.g., Bachman, Bare, & Frankie, 1986; Greenberger, Steinberg, & Vaux, 1981; and Steinberg, 1982, as discussed in Bachman & Schulenberg, 1991). Other research, however, has identified possible positive outcomes of work experience, such as personal responsibility and orientation toward the future (e.g., Steinberg et al., 1982, as discussed in Bachman & Schulenberg, 1991). As a result of the limitations of some of the studies they synthesized, Bachman and Schulenberg conclude that there is "general agreement among the researchers that the causal direction between part-time work and the positive and negative correlates has not been fully addressed, leaving open the possibility that part-time work has little unique impact on any of the established positive or negative correlates."

In their own investigation of the issue, Bachman and Schulenberg (1991) examine how the number of hours worked by high school seniors was "linked to indicators of psychosocial functioning and adjustment," including drug and alcohol use, aggression, victimization, time spent on sleep and exercise, evenings out, and subjective experiences such as satisfaction and self-esteem. They find that "each increase in the number of hours worked is associated with an increase in one or more of the problems," such as drug use, interpersonal aggression, theft, trouble with the police, problems with parents, victimization, not eating breakfast, and less sleep and exercise. The major exception to this pattern was found among those who worked only one to five hours each week; the differences between this group and those who did not work at all were minor and inconsistent.

Although Bachman and Schulenberg (1991) acknowledge that employment is correlated with many negative consequences, they are reluctant to place the blame on employment per se. Thus, for example, they suggest that the link between employment and drug use may be the result of students becoming financially able to afford drugs. Similarly, they suggest that the link between poor school performance and employment may simply reflect the fact that those with a history of poor school performance or disinterest in school choose to work longer hours than their more academically able peers. They conclude, therefore, that "it remains likely that long hours (and high earnings) are reactions to other factors"; hence, "policies aimed to curb hours or earnings may miss the mark" (Bachman & Schulenberg, 1991).

Steinberg, too, is reluctant to completely condemn teenage employment as being detrimental to academic achievement. Although he agrees that there is a fairly consistent pattern showing a negative relationship between number of hours worked and academic achievement, he suggests that differences in work experiences "are likely to be important mediators and moderators of the relation between school and work." Thus, jobs that entail reading, writing, and arithmetic calculations may have a more positive impact on GPA than others not requiring these mental activities (Steinberg et al., 1988). He further notes that food service workers, who constitute the most sizable portion of student employees, "spend less than 2 percent of their time on these three types of activities combined."

Thus, although the link between academic achievement and employment has been studied extensively, no clear explanations for why intensive employment undermines academic achievement have emerged. Based on the existing research, Steinberg offers several possible explanations, citing the relevant research on which each of his hypotheses is based (Steinberg et al., 1988): working (1) undermines students' attachment to school, thereby diminishing their performance (Steinberg et al., 1982); (2) obstructs students in their efforts to complete school assignments such as homework (McNeil, 1984); (3) negatively affects students' health and well-being, inhibiting their ability to perform in school (Greenberger, Steinberg, & Vaux, 1981); and (4) causes students to lose interest in furthering their education, thereby diminishing their motivation to succeed in school (D'Amico, 1984; Mortimer & Finch, 1986). He suggests that to reach more accurate conclusions about the effects of youth employment, researchers must examine more closely the processes occurring in specific types of jobs (Steinberg et al., 1988).

Apprenticeships

Apprenticeships have been a fixture in America since colonial times. More recently, labor unions have used them in various trades, but the total number of Americans enrolled is comparatively small. Each year in the United States approximately one-quarter of a million people enroll in apprenticeships, a figure that represents only 0.3 percent of the workforce (Hamilton, 1990a). On average, these apprentices are young men about 27 years old. In contrast, apprenticeship is the largest form of upper-secondary education in West Germany, with approximately 70 percent of 16- to 19-year-olds involved. The apprenticeship tradition is also often credited with helping West Germany achieve its economic boom after World War II (Hamilton, 1990a, 1990b). Currently in the United States, there is tremendous interest in apprenticeships, and many pilot projects have been initiated.

Although youth apprenticeships have not been studied extensively in this country, there is evidence to support the hypothesis that "the quality of students' jobs affects how they come to feel about work in general" (Stern et al., 1990). A longitudinal study of high school students finds that the opportunity to learn on the job served as a predictor of motivation to do good work and that students who use their knowledge in their jobs developed more positive attitudes toward work in general. The researchers conclude that school authorities and employers could facilitate the development of a positive orientation toward work by helping students find jobs with these particular characteristics (Stern et al., 1990).

In addition to developing a sound work ethic, some other potential benefits of the apprenticeship model include personality development, an understanding of organizational structure and processes, and the acquisition of job-related skills (Hamilton, 1990b). For example, research in West Germany finds that apprentices in large firms learn to interact with a wide range of people, participate in elected work councils, engage in autonomous decision making, and develop self-confidence and other appropriate work-related behaviors (Hamilton, 1990b). Other advocates argue that the prospect of entering an attractive occupation gives students an incentive to learn and achieve while they are in high school. They point out that for many, a high school diploma leads only to a dead-end job, and it is therefore difficult to see the link between hard work in high school and a successful career (Toch, 1991).

To test the feasibility and impact of apprenticeships, Cornell University has initiated a pilot project in Broome County, New York, which is modeled, in part, after the German system. Five school systems are participating in the project. In Fall 1991, 25 high school juniors enrolled in apprenticeships in manufacturing, engineering technology, administration and office technology, and health care. Each student will work between 10 and 20 hours each week and, in some cases, full-time during the summer vacation. The goal of this research project is to determine "how to structure teaching and learning in the workplace and how to relate work experience to school" (Hamilton, Hamilton, & Wood, 1991). Advocates of this project contend that the part-time work experience of most high school students is detrimental to their education because their duties and responsibilities are often irrelevant to what they have learned in school. Thus, many young people fail to make the connection between job-related competence and academic knowledge and skills (Hamilton, Hamilton, & Wood, 1991).

The Broome County Project is guided by several important principles that its organizers believe are fundamental to any successful apprenticeship program (Hamilton, Hamilton, & Wood, 1991). One premise is that youth apprenticeship is potentially appropriate for anyone, not just at-risk or noncollege-bound students, although such students may benefit the most. Second, the relationship between employers and apprentices is a contractual one, based on mutual responsibilities in which work is exchanged for pay and learning opportunities. A third principle is that apprenticeships should be organized by career areas rather than by specific jobs. This approach ensures that students are trained in a broad range of skills, thereby maximizing their learning opportunities. Finally, curricula enhancing both school-based and work-based learning should be created to firmly establish the interconnectedness of school and work.

Advocates of apprenticeship argue that the time is ripe for change. Businesses and others are calling for school reform, and the United States has become increasingly aware of the need for an educated and trained workforce that will enable the country to remain competitive with the Europeans and Japanese (Hamilton, 1990a). One result of employers' refusing to hire and train teenagers is that students are "isolated from jobs that require academic learning." Many young people do not think ahead to career paths and promotion to jobs that require reading, writing, mathematics, problem solving, and an ability to continue learning (Hamilton, 1990a). To reverse this trend, schools must become more flexible in scheduling, grading, and offering credit. Unions, managers, and schools must work collaboratively to ensure that workplaces become places of learning (Hamilton, 1990a, 1990b).

Although the benefits of a German-style apprenticeship system seem attractive, many are quick to point out potential problems that are likely to arise in this country. For example, an influx of young apprentices may drive down salaries, displace current workers, and encroach on union-controlled training programs (Toch, 1991). Others criticize the rigidity of the German educational system, which is less accommodating to those whose academic aptitudes and/or skills blossom later in life, to those who develop new interests, or to those who may want to change careers after a short period of time. Also, as Hamilton acknowledges, West German apprenticeship prepares youth for specific occupations, in contrast to schooling in the United States, which offers general preparation for work. This difference is particularly important because flexibility and diversity are more characteristic of the American education system. Further, many employers assert their need for generally educated employees. Advocates of the system acknowledge that the United States cannot "import" the West German apprenticeship system as a whole, but instead must adapt it to suit our particular needs (Hamilton, 1990a).

The impact of apprenticeships among school-age youngsters in the United States is, at this point, difficult to determine because many current programs have only recently been introduced (Kazis, 1991). Nevertheless, the W. T. Grant Foundation Commission on Work, Family, and Citizenship (1991) notes that expanding student apprenticeship opportunities is becoming a central ideal in the proposals of many reformers who wish to strengthen the bond between school and work. The Commission also reports that these new initiatives are based more on an "American model"--where the schools play the major role in educating and training--rather than the "European model"--where employers play the dominant role.

At the state level, Oregon and Wisconsin have introduced plans and/or programs that promote hands-on, experienced-based learning or apprenticeships. The legislators of both states enacted bills in 1991 that call for students to choose a college preparatory course of study or a professional, technical or vocational course of study after the tenth grade. Other notable programs and projects introduced during the past two years (William T Grant Foundation Commission on Work, Family and Citizenship et al., 1991) include:

- The Arkansas Youth Apprenticeship Initiative, a government-sponsored effort to provide funding to strengthen existing apprenticeship programs and create new programs in health services, industrial machinery, small-scale retail management, metal-working, and food service processing/management
- The Pennsylvania Youth Apprenticeship Program has established a new four-year integrated curriculum combining academic, technical and occupational education for 16- and 17-year-olds completing the tenth grade
- The Council of Great Lakes Governors Youth Apprenticeship and School-to-Work Initiative, which seeks to strengthen school-to-work transition programs in eight states by (1) serving as an information clearinghouse on state programs and projects, (2) fostering collaborative efforts in complementary industries and occupations across state lines, and (3) developing mutually recognized standards and certification for workers in each state

Advocates of apprenticeships anticipate that these and other similar efforts will result in improvements in academic learning and achievement, enhancing the individual productivity and future socioeconomic status of the young apprentices. At the very least, apprenticeships represent a dramatic change in students' use of time.

Summary

As we began to gather reading matter on out-of-school uses of time, we were pleasantly surprised to find at least some literature in each of the areas that we planned to cover. It had seemed entirely possible that no information would be available on, for example, participation in and impacts of youth programs run by community-based organizations. Fortunately, that was not the case. However, as both original researchers and the synthesizers of research whom we cite consistently point out, the research on most of the topics covered leaves a great deal to be desired. Even in areas where there is strong academic interest, such as the educative function of families, many research avenues remain unexplored.

The problems with the research on out-of-school uses of time point to a number of issues that warrant future research attention. Specific issues include the following:

- Determining the nature and quality of the program or activity: Many of the existing analyses of afterschool child care programs, tutoring and mentoring initiatives, enrichment activities, and youth organizations are at the level of participation vs. nonparticipation. There is little rich description, and very few studies have attempted to link specific activities, components, or approaches within programs to precise outcomes for participants.

- Determining variable impacts. Most of the research reviewed at least acknowledges that socioeconomic status, race/ethnicity, and cultural attitudes toward learning play some role in the benefits derived from various out-of-school uses of time. However, the relationships between these factors and variations in outcomes remain murky.

- Determining broader impacts. Defining, describing, or counting the effects of out-of-school activities for participating children and youth is only one level of impact. Successful programs may also qualitatively affect the lives of participating adults, the families of student participants, and the institutional or community ethos. Little is known about these broader outcomes.

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